graflex®

SERVICE INSTRUCTIONS AND PARTS LIST

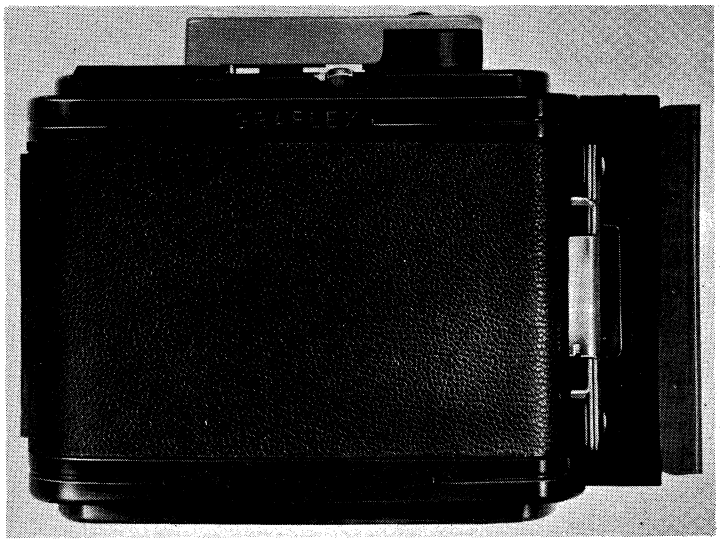
KNOB AND LEVER ADVANCE ROLL HOLDERS

MODEL II ROLL HOLDERS

70mm ROLL HOLDER, RH/50

GRAFMATIC® 45

GRAFMATIC® "23"



SERVICE INSTRUCTIONS AND PARTS LIST

Graflex

KNOB AND LEVER ADVANCE

ROLL HOLDERS

SINGER
GRAFLEX DIVISION

THE SINGER COMPANY / GRAFLEX DIVISION, ROCHESTER, NEW YORK

ROLL HOLDERS

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SECTION I

A. INTRODUCTION

This manual provides service instructions for repair of Graflex Lever Advance and Knob Advance Roll Holders. Obvious procedures are not stated. The parts list clearly describes the differences between models.

B. DISASSEMBLY

Disassemble Roll Film Holder complete in accordance with figure 1. The index numbers are in disassembly sequence. Disassemble the Carriage Complete in accordance with figure 2 - 1st, 2nd, and 3rd stages. Refer to the following which pertains to disassembly procedures.

CAUTION

The sun pinion (6), machine screw (28), exposure dial (9), winding key (35), all have left hand threads and must be turned in a clockwise direction to remove.

To assemble or disassemble film roller (44A) gently spread carriage to avoid distortion.

NOTE

Lubrication needed only on reassembly.

C. CLEANING

Clean the disassembled parts as follows:

WARNING

Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; do not use near flame. Avoid contact with the skin; wash off any that spills on the hands.

1. Clean the unpainted metal mechanical parts with chlorothene. Dry the cleaned parts thoroughly; use a clean lint free cloth or a gentle blast of compressed air. When cleaning parts of the carriage mechanism such as gears and levers, use a small brush moistened with the cleaning compound to clean the parts thoroughly.

2. Wipe painted metal parts with a soft, lint free cloth moistened with cleaning compound. Thoroughly dry the cleaned parts with a dry, lint free cloth.

3. Clean plastic parts with a damp cloth and mild soap and water. Dry thoroughly with a soft, lint free cloth.

D. REASSEMBLY

Reassemble in accordance with the procedures that follow. All parts requiring lubrication and adhesives are listed in paragraph F.

CAUTION

Prior to reassembling the parts of the Roll Holder, refer to Table 2 to insure all parts requiring lubrication during reassembly are properly lubricated.

1. Insert roller (44A) into its top and bottom mounting holes in the carriage assembly (44). Roller must rotate freely after assembly.

2. Assemble bottom plate (42) and secure with three self threading screws (43).

3. Position film advance pinion (34) into its mounting hole. Assemble large flat washer (37), small flat washer (36) to bottom of pinion and secure with winding key (35).

CAUTION

The winding key (35) has left hand threads and must be turned in a counterclockwise direction to assemble.

4. Assemble flat washer (33), lock ratchet (32) and flat washer (31) on film advance pinion (34).

CAUTION

When assembling the lock ratchet (32), rounded side of teeth must face downward.

5. Position intermediate gear (30) over its mounting hole so that a tooth in the gear is in mesh with a tooth on the film advance pinion (34). Insert the short end of the intermediate pinion (29) through hole in the intermediate gear and into its mounting hole in the carriage.

CAUTION

When assembling the intermediate gear (30) rounded side of teeth must face downward.

6. Insert machine screw (28) through hole in carriage and apply a piece of tape over the head of screw to hold screw in place. Assemble the counter gear (27) over the machine screw with blank segment on gear facing the intermediate pinion (29) and the identification hole dressed perpendicular to the rear surface of the carriage. Assemble cam (26) locating the large and small studs on bottom of cam into mating holes in the counter gear (27). Cam must seat flat on the counter gear.

CAUTION

When assembling the counter gear (27) rounded side of teeth must face downward.

7. Assemble flat washer (25) on spool bearing (24); insert spool bearing through hole in carriage. Apply a piece of tape over the head of bearing to hold bearing in place. Assemble spacer (23), counter engaging lever (22), engaging lever bearing (21) and engaging lever spring (20). Short shank of spring must face downward and locate against the tab on counter engaging lever.

8. Attach the hook end of the lock lever spring (19) onto side of lock lever assembly (18). Assemble lock lever assemby (with lock lever spring attached) over the intermediate pinion (29). Position the lock lever to locate the spring portion of the lever under cam (26) and the lever portion on the blank surface of the cam.

9. If removed, assemble ring gear pawl spring (17A) under the ring gear pawl. The two formed ends of the spring should locate on the rear side of the pawl.

10. Carefully position the bearing plate assembly (17) over the carriage mechanism. Check the lock lever spring (19), making sure the hook end engages the lock lever assembly (18). Remove tape securing spool bearing (24) and thread bearing into its mounting hole in the bearing plate assembly. If removed, thread the non-reverse pawl spring (16) over stud on bottom side of the bearing plate assembly. Wind the bottom shank of the non-reverse pawl spring in a counterclockwise direction until it forces the non-reverse pawl, riveted to the bottom side of the bearing plate assembly, to locate against the lock ratchet (32). Continue winding the bottom shank of the spring until it is pointing outward; slide spacer (15) in place. Apply downward pressure on bearing plate assembly to retain spacer. Release the spring and secure spacer by inserting machine screw (14) up through hole in carriage, through spacer, and thread screw into its tapped hole in bearing plate assembly.

11. With the short shank of the engaging lever spring (20) against the tab on counter engaging lever (22), wind long shank of spring in a clockwise direction and locate it behind Tab B on the bearing plate assembly (17). Use a paper clip with a small hook on the end to wind the straight shank of the lock lever spring (19) in a counterclockwise direction and locate it behind Tab A on the bearing plate assembly (17).

12. Position the top plate assembly (10) over the bearing plate assembly (17). Remove tape securing machine screw (28); hold screw in place. Thread the exposure dial (9) onto machine screw until keyway on dial is opposite the key on cam (26) and the letter S on dial is near the index mark on the top plate assembly. Tighten machine screw.

NOTE

The top plate assembly (10) will be secured in a later step.

13. Position the ring gear pawl and ring gear pawl spring away from the film advance pinion. Assemble the film advance lever spring (8) over the film advance pinion with bottom loop of the spring over the milled stud on the bearing plate assembly.

14. Position the planet gear carrier assembly (7) on the film advance pinion with the large stud on the bottom of the carrier assembly located in the upper loop of the film advance lever spring (8).

15. Thread sun pinion (6) onto the film advance pinion.

CAUTION

The sun pinion (6) has left hand threads and must be turned in a counterclockwise direction to assemble.

16. Use a paper clip or a small tool to push the ring gear (5) pawl clockwise under the planet gear carrier assembly (7) and hold in place. Use a small tool inserted through screw hole in the carrier assembly and hold the ring gear pawl toward the film advance pinion. While holding the pawl, slide the ring gear down over the tool; seat the ring gear in place and withdraw the tool. The ring gear pawl and the ring gear pawl spring should locate within the ring gear as shown in Diagram A.

17. Assemble a planet pinion (4) to each of the two posts on the planet gear carrier assembly (7).

18. Assemble film advance lever (3), film advance lever cap (1) and secure with two machine screws (2).

19. Assemble upper and lower guides (40 and 39) on film roller (41) with flanged edges of holes toward the roller. Position the film roller and guides in carriage so that the film roller (41) is 0.002 to 0.010 inches behind the pressure plate surface of the carriage. Assemble self threading screw (38) and tighten. Assemble self threading screw (13, fig. 2, 2nd stage) just enough to hold the upper guide in place. Assemble self threading screws (11 and 12). Do not tighten screws.

20. Operate the carriage mechanism thru several simulated "exposures" to allow for self alignment of the gears, bearing plate and top plate assembly. If binding occurs, apply pressure at either end of the top plate assembly and shift it slightly until smooth operation is obtained. When smooth operation of the carriage mechanism has been obtained, hold the top plate assembly in position and tighten self threading screws (11, 12 and 13). Apply a small drop of Glyptol around the heads of screws and to screw notches of the upper and lower guides.

ROLL HOLDER

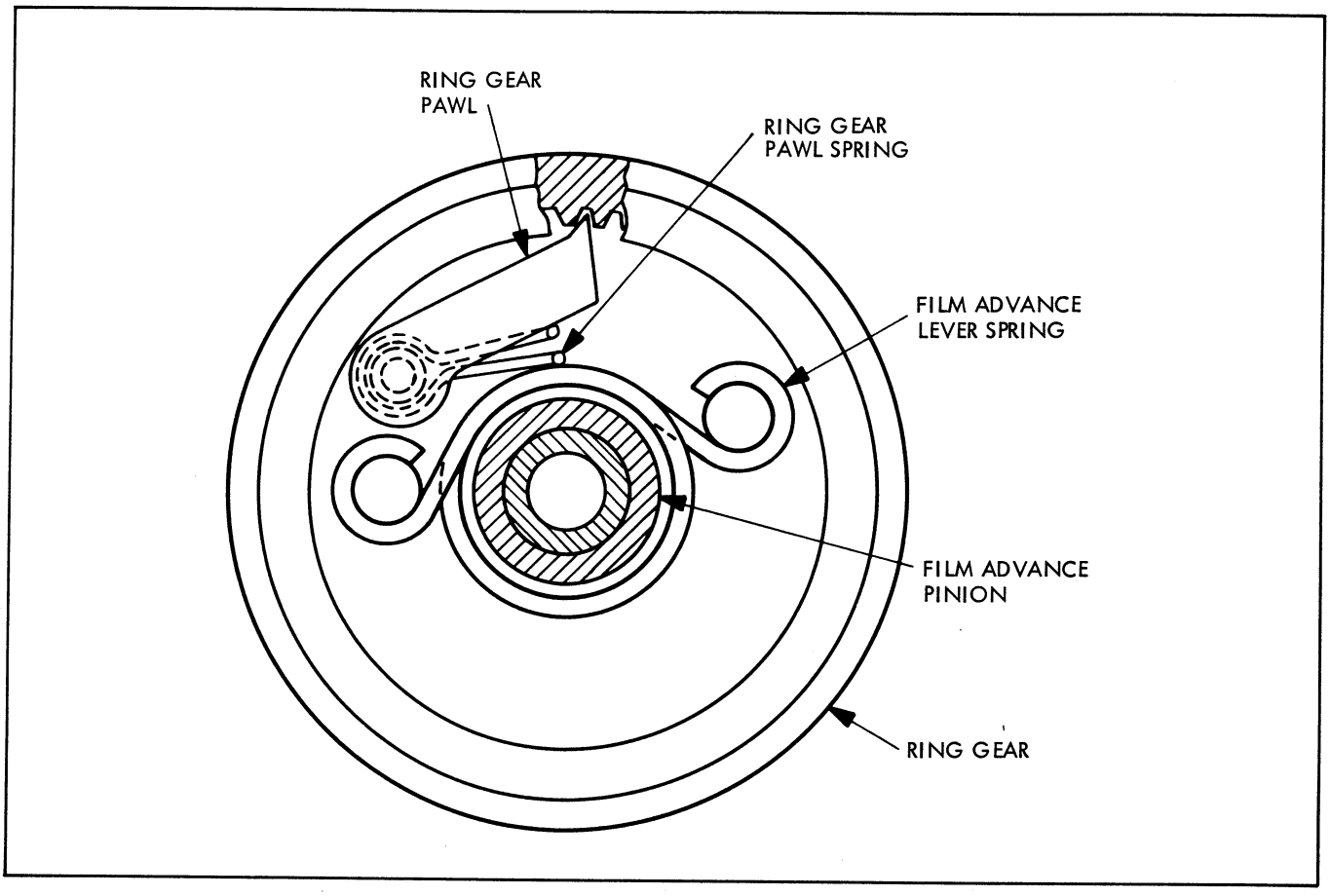

Diagram A

E. TROUBLE AND REMEDY TABLE

The purpose of the following table is to list possible repairs and adjustments.

Before disassembling the Roll Holder, check for loose or missing screws, or parts that are binding because of misalignment or lack of lubrication.

TABLE I-1

MODEL	TROUBLE	CAUSE	REMEDY
Both	Lock lever does not catch when released from locked position	Defective lock lever assembly (18, fig. 2, 2nd stage) broken	Replace lock lever assembly
Both	Metering mechanism binds or jams	Bearing plate assembly (17, fig. 2, 2nd stage) out of alignment	Realign plate assembly and mechanism components
Both	Negative not sharp - one side or generally; and/or fogged streaks caused by light leaks	Screw 24, fig. 2, 2nd stage missing	Replace screw
		Light seal at end of cover damaged	Replace light seal, cement in place with EC-880 cement
		Slide damaged	Replace slide

TABLE I-1 (CONT.)

MODEL	TROUBLE	CAUSE	REMEDY
Both	Pictures do not start at No. 1 (on film) Dial does not rotate at exposure start	Spring (20, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Both	Not full number of pictures per roll or in wrong position on roll	Lock lever assembly (18, fig. 2, 2nd stage) bent or damaged	Replace lock lever
		Improper threading	See loading instructions
Both	At end of roll, dial moves back and forth between "12", "10", or "8" and "S"	Lock lever assembly binding	Lubricate plate assembly
Both	Film winds through without stopping on numbers	Spring (19, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Both	Dial free-wheels at #1, #2, or #3 instead of #8, #10, or #12; numbers not in synchronization with film	Dial in wrong position in relation to cam	Rotate dial 180°
Both	Dial only partially locks at each number; slightly forcing film advance lever (or winding knob) will permit winding to succeeding exposures without stopping	Ratchet (32, fig. 2, 2nd stage) reversed, rounded edge faces toward plate assembly	Reverse ratchet
Both	Winding key (and/or knob) turns freely in either direction	Spring (16, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Both	Back cover does not fit correctly - may not close and latch	Top or bottom plate (10 or 17, fig. 2, 2nd stage) out of alignment with carriage	Realign plate
Lever	Film advance lever fails to return	Return spring (8, fig. 2 1st stage) broken or unhooked	Rehook or replace spring
Lever	Film advance lever fails to advance film	Spring or pawl on bearing plate assembly (17, fig. 2, 2nd stage) broken	Replace spring or plate assembly
Lever	Film advance lever binds before completing full swing	Top plate (10, fig. 2, 2nd stage) out of adjustment	Readjust plate
Both	Film scratch	Film flattener rollers not turning freely	Lubricate with dry molykote and alcohol

F. LUBRICANTS, CLEANING SOLVENTS, AND ADHESIVES

TABLE I-2

COMPOUND	MANUFACTURER	USE OR APPLICATION
LUBRICANTS:		Figure I-2, 2nd stage:
Special mixture (39484-P1) of (1 teaspoon) Alpha Molykote Type Z and (2 ounces) FS-1290 Fluorosilicone grease.	Alpha Molykote Corp. Stamford, Conn.	Bearing diameters of film advance pinion (34), rounded side of teeth on intermediate gear (30), rounded side of teeth on counter gear (27), bottom surface of cam (26), and all bearing surfaces on plate assembly (17). Figure II-2, 2nd stage: Bearing diameters of film advance pinion (39), rounded side of teeth on intermediate gear (35), rounded side of teeth on counter gear (31), bottom surface of cam (22), and all bearing surfaces on plate assembly (20).
Texaco Unite mp ANG-25-AM2 (39484-P3)	Texaco	Figure I-2 & II-2, 1st stage: Outside diameter and center hole and center hole of planet gear carrier assembly (7), teeth of sun pinion (6), bearing diameter of ring gear (5), and teeth of two planet pinions (4). Figure I-2, 3rd stage: All gear and pinion bearing contact surfaces on item (45). Figure II-2, 3rd stage: All gear and pinion bearing contact surfaces on item (49).
Neolube (39484-P4)	Huron Industries Huron, Mich.	Figure I-2, 3rd stage: Bearing ends of roller (41) and (44A). Figure II-2, 3rd stage: Bearing ends of roller (48) and (49).
CLEANING SOLVENTS:		
Chlorothene	Dow Corning Corp. Midland, Mich.	All metal parts

TABLE I-2 (CONT.)

COMPOUND	MANUFACTURER	USE OR APPLICATION
ADHESIVES:		
EC-880 (39491-P13)	Minnesota Mining and Mfg. Co.	Light seal to cover assembly
		Figure I-2, 2nd & 3rd stage:
Glyptol ZV-903 cement (39490-P1)	General Electric	Heads of screws (11), (13), (38), feet of upper and lower guides on inside of carriage, bearing (24), key (35), screw (15), and bearing (18).
		Figure II-2, 2nd & 3rd stage:
		Heads of screws (12), (14) and (45), and guides (46) and (47).

G. ILLUSTRATED PARTS LIST

The parts lists following are presented in the order of disassembly. Each parts list is arranged in five columns that include "Figure & Index No.", "Part Number", "Nomenclature", "Qty", and Model Code. An explanation of the information in each column follows:

Figure & Index No. - The Figure & Index No. column contains a list of index numbers that are keyed to the accompanying illustrations. The figure to which the index numbers apply are listed at the top of the column on each page containing a parts list. DO NOT use the figure or index number in correspondence - specify the catalog or part number and name.

Part Number - The Part Number column contains the number that is to be used for ordering parts. When there is more than one number for a part, both numbers are listed and only one index number is provided. The models or subassemblies to which the part numbers apply are covered by the Model Code column.

Nomenclature - The Nomenclature column contains the name of the part which should also be included with the part number when ordering parts. The nomenclature column also shows the relationship between assemblies, subassemblies, and detail parts. All parts common to an assembly or subassembly are indented one space and are listed directly under the item. Assemblies or subassemblies that are shown disassembled are not indexed.

Main assemblies and subassemblies that are not disassembled in the list are indexed and shown in their order of removal from the holder. The Nomenclature column contains a reference to the figure where the parts of the subassembly are disassembled.

Attaching parts are shown throughout the parts lists by the use of the words "ATTACHING PARTS" in the Description column. The end of a listing of attaching parts is denoted by ---*---.

Qty - The Qty column lists the total quantity of parts used in the holder. When the quantity varies for different models, the part is listed more than once and the different quantity is given.

Model Code - The Model Code column denotes the model or subassembly to which each part in the list applies. The model numbers or part numbers which the list covers are listed at the top of the column. The applicability of parts to each model is then indicated by x in the model column.

Both lever advance and knob advance models are covered. Lever advance models are indicated by the letter (L) following the description in the nomenclature column. Knob advance models are indicated by the letter (K).

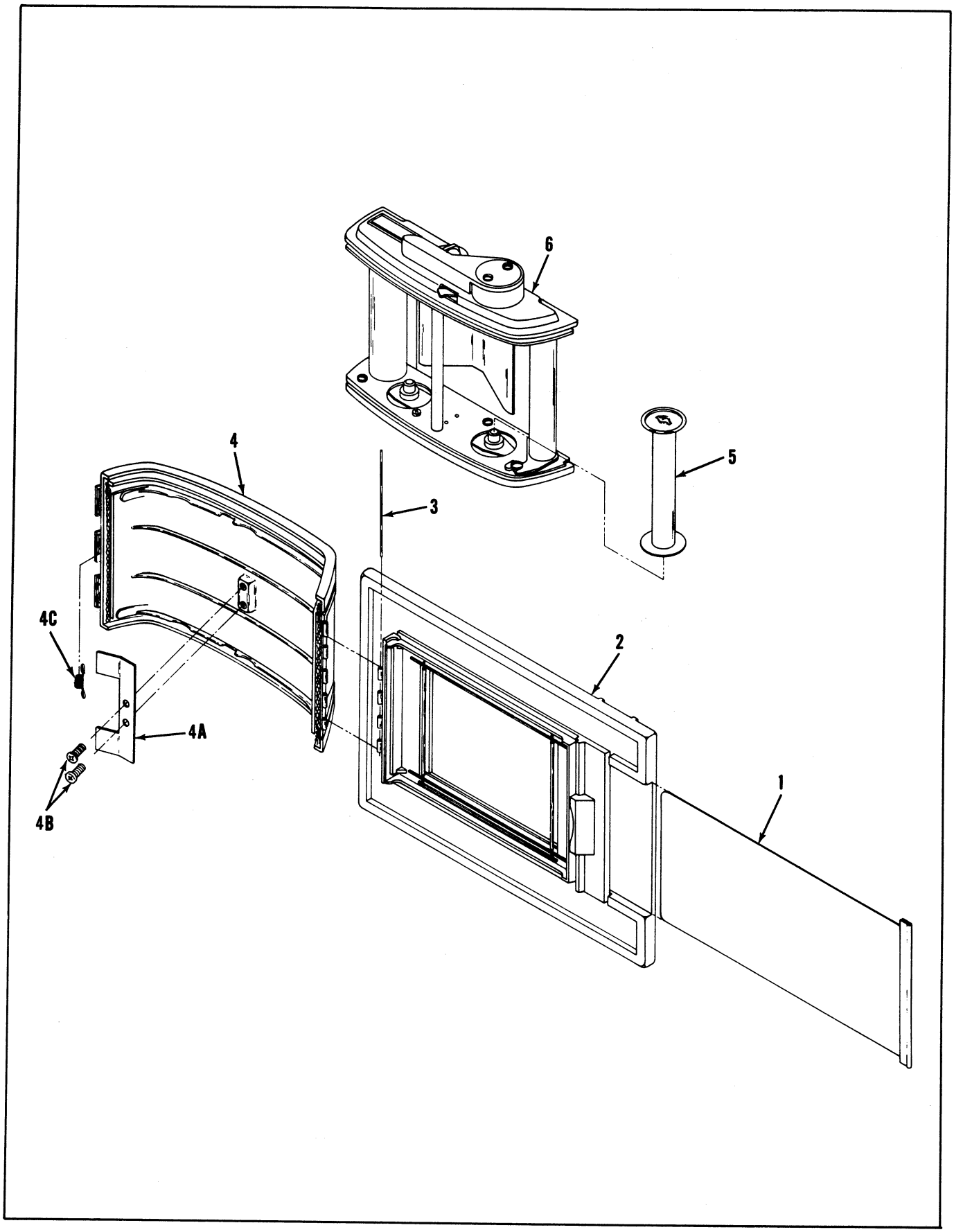

Figure I-1. HOLDER COMPLETE

ROLL HOLDER

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS									
				39606-G1	39606-G2	39606-G3	39606-G4	39606-G5	39606-G6	39786-G1	39786-G3	39786-G9	39786-G11
1-	39606G1	Holder Complete-Roll Film(8 Exposure-"23") (L)	1	x									
	39606G2	Holder Complete-Roll Film(10 Exposure-"23") (L)	1		x								
	39606G3	Holder Complete-Roll Film(12 Exposure-"23") (L)	1			x							
	39606G4	Holder Complete-Roll Film(8 Exposure-"45") (L)	1				x						
	39606G5	Holder Complete-Roll Film(10 Exposure-"45") (L)	1					x					
	39606G6	Holder Complete-Roll Film(12 Exposure-"45") (L)	1						x				
	*31786G1	Holder Complete-Roll Film(8 Exposure-"23") (K)	1							x			
	*31786G3	Holder Complete-Roll Film(12 Exposure-"23") (K)	1								x		
	*31786G9	Holder Complete-Roll Film(8 Exposure-"45") (K)	1									x	
	*31786G11	Holder Complete-Roll Film(12 Expsoure-"45") (K)	1										x
-1	39625G1	. Slide, Complete	1	x									
	39625G2	. Slide, Complete	1		x								
	30649-G3	. Slide, Complete	1			x				x	x		
	30649-G5	. Slide, Complete	1				x	x	x			x	x
-2	31831-G1	. Frame Assembly (see note below)	1	x						x			
	31831-G13	. Frame Assembly	1		x						x		
	31831-G3	. Frame Assembly	1			x							
	31831-G9	. Frame Assembly	1				x					x	
	31831-G14	. Frame Assembly	1					x					
	31831-G11	. Frame Assembly	1						x				x
-3	30172-30	. Pin, Straight	1	x	x	x	x	x	x	x	x	x	x
-4	31787G6	. Cover Assembly	1	x	x	x	x	x	x	x	x	x	x
-4A	31791	. . Spring, Film Pressure	1										
		(ATTACHING PARTS)											
-4B	30921-28L	. . SCREW, Self Threading	2										
		---*---											
-4C	33813	. . Spring, Latch	1										
	31787P2	. . Seal, Light (not illustrated)	2										
-5	31835	. Spool	1	x	x	x	x	x	x	x	x	x	x
-6	31797G3	. Carriage Complete (Figure 2).	1	x			x						
	31797G4	. Carriage Complete (Figure 2).	1		x			x					
	31797G5	. Carriage Complete (Figure 2).	1			x			x				
	31797G1	. Carriage Complete (Figure 2).	1							x		x	
	31797G2	. Carriage Complete (Figure 2).	1								x		x

*Discontinued Models

(L) - Lever Advance Models

(K) - Knob Advance Models

Note: For frame replacement see latch repair diagram and notes.

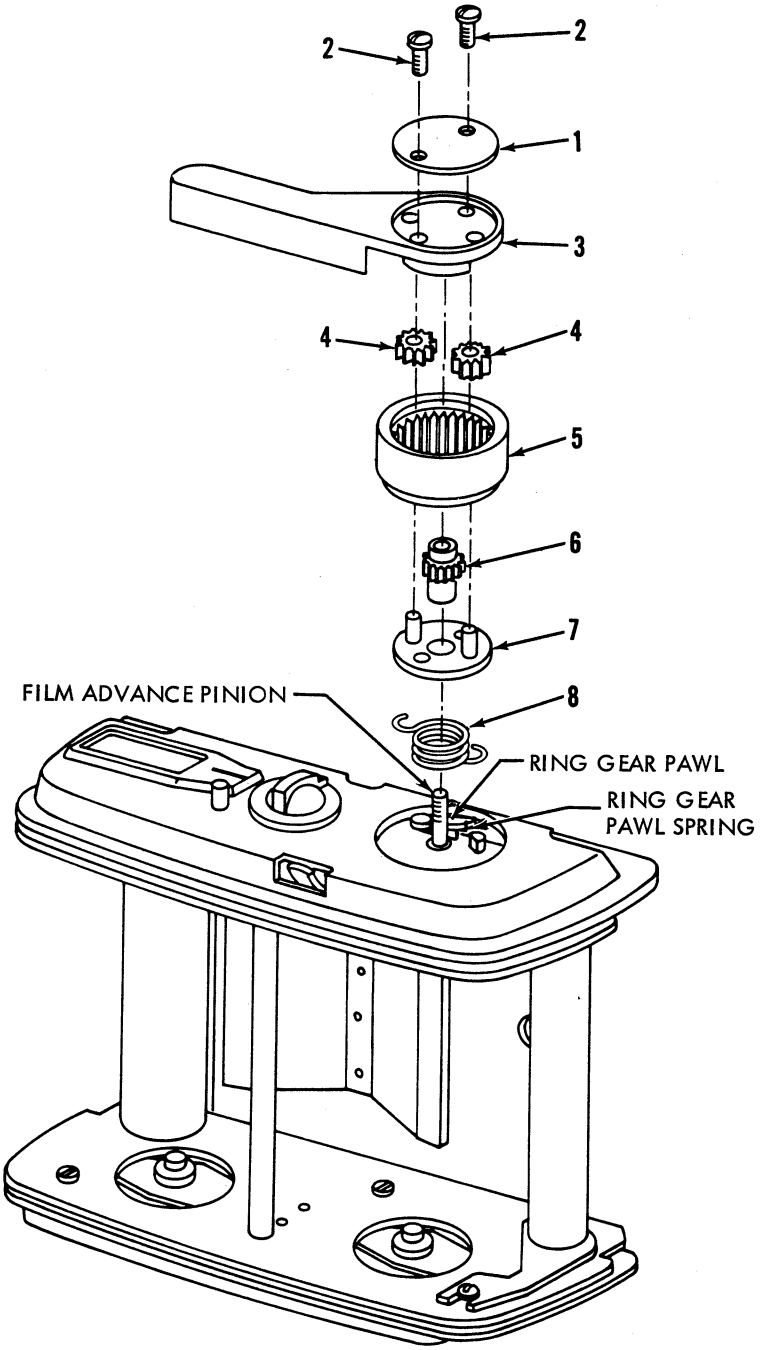

Figure I-2. CARRIAGE COMPLETE, 1ST STAGE

ROLL HOLDER

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 31797G3	31797G4	31797G5	31797G1	31797G2
2-	31797G3	Carriage Complete (8 Exposure) (L) . . . . . (1st Stage Disassembly)	1	x				
	31797G4	Carriage Complete (10 Exposure) (L) . . . . . (1st Stage Disassembly)	1		x			
	31797G5	Carriage Complete (12 Exposure) (L) . . . . . (1st Stage Disassembly)	1			x		
	*31797G1	Carriage Complete (8 Exposure) (K) . . . . . (1st Stage Disassembly)	ref				x	
	**31797G2	Carriage Complete (12 Exposure) (K) . . . . . (1st Stage Disassembly)	ref					x
-1	39613	. Cap, Film Advance Lever . . . . . (ATTACHING PARTS)	1	x	x	x		
-2	39622	. Screw, Machine (special) . . . . . ---*---	2	x	x	x		
-3	39612P1	. Lever, Film Advance	1	x	x	x		
	31829G1	. Knob, Film Winding (ref. 2nd stage Disassembly)	1				x	x
-4	39611P1	. Pinion, Planet.	2	x	x	x		
-5	39610P1	. Gear, Ring	1	x	x	x		
-6	39609P1	. Pinion, Sun	1	x	x	x		
-7	39614G1	. Carrier, Planet Gear	1	x	x	x		
-8	39608P1	. Spring, Film Advance Lever	1	x	x	x		

* Discontinued - replace with 31797G3

** Discontinued - replace with 31797G5

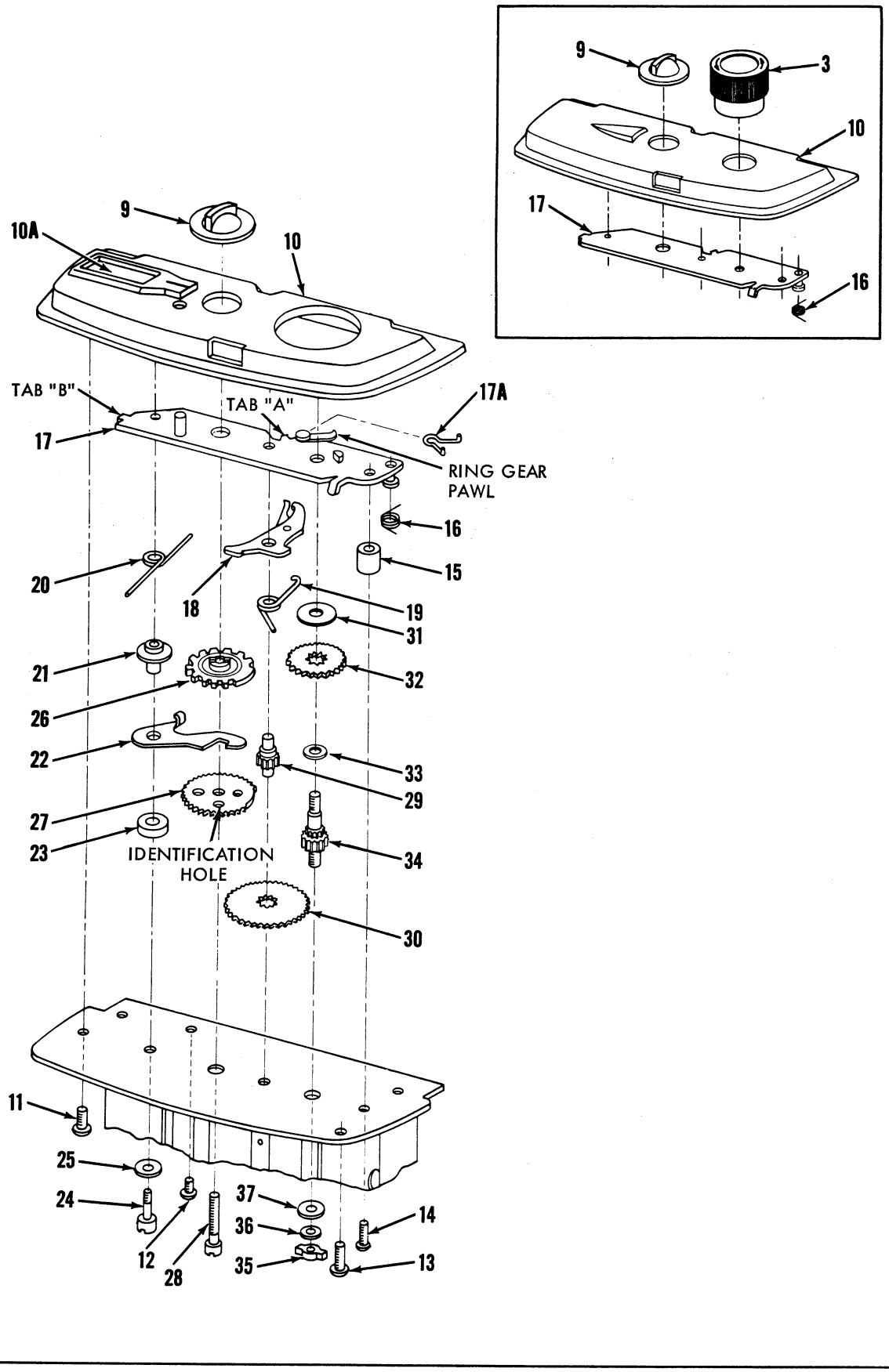

Figure I-2. CARRIAGE COMPLETE, 2ND STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 31797G3	31797G4	31797G5	31797G1	31797G2
2-9	31828P1	. Dial, 8 Exposure (2nd stage Disassembly) . . .	1	x			x	
	31828P2	. Dial, 12 Exposure	1			x		x
	31828P3	. Dial, 10 Exposure	1		x			
-10	39623-G1	. Plate Assembly, Top	1	x	x	x		
-10A	31888P2	. . Panel, Notation	1					
	31827P1	. Plate, Top	1				x	x
		(ATTACHING PARTS)						
-11	33921-13L	. Screw, Self Threading	1	x	x	x	x	x
-12	33921-1L	. Screw, Self Threading	1	x	x	x	x	x
-13	33921-23L	. Screw, Self Threading	1	x	x	x	x	x
		---*---						
-14	102-2-6L	. Screw, Machine	1	x	x	x	x	x
-15	31809	. Spacer.	1	x	x	x	x	x
-16	39605	. Spring, Non-Reverse Pawl.	1	x	x	x	x	x
-17	31805G2	. Plate Assembly, Bearing	1	x	x	x		
	31805G1	. Plate Assembly, Bearing	1				x	x
-17A	39620	. . Spring, Ring Gear Pawl	1					
-18	31817G1	. Lever Assembly, Lock.	1	x	x	x	x	x
-19	31816P1	. Spring, Lock Lever	1	x	x	x	x	x
-20	31825	. Spring, Engaging Lever	1	x	x	x	x	x
-21	31822	. Bearing, Engaging Lever	1	x	x	x	x	x
-22	31823P1	. Lever, Counter Engaging	1	x	x	x	x	x
-23	31824	. Spacer	1	x	x	x	x	x
-24	31826	. Bearing, Spool	1	x	x	x	x	x
-25	41846-1	. Washer, Flat	1	x	x	x	x	x
-26	31820P1	. Cam, 8 Exposure.	1	x			x	
	31820P3	. Cam, 10 Exposure	1		x			
	31820P2	. Cam, 12 Exposure	1			x		x
-27	31821P1	. Gear, Counter	1	x	x	x	x	x
-28	31834P2	. Screw, Machine (special)	1	x	x	x	x	x
-29	31814P1	. Pinion, Intermediate	1	x	x	x	x	x
-30	31815P1	. Gear, Intermediate.	1	x	x	x	x	x
-31	40627-15	. Washer, Flat	1	x	x	x		
-32	31813P1	. Ratchet, Lock.	1	x	x	x	x	x
-33	30473-14	. Washer, Flat	1	x	x	x		
-34	39607P1	. Pinion, Film Advance	1	x	x	x		
	31810P1	. Pinion, Film Advance	1				x	x
		(ATTACHING PARTS)						
-35	31811P1	. Key, Winding	1	x	x	x	x	x
-36	40627-16	. Washer, Flat	1	x	x	x	x	x
-37	30473-41	. Washer, Flat	1	x	x	x	x	x
		---*---						

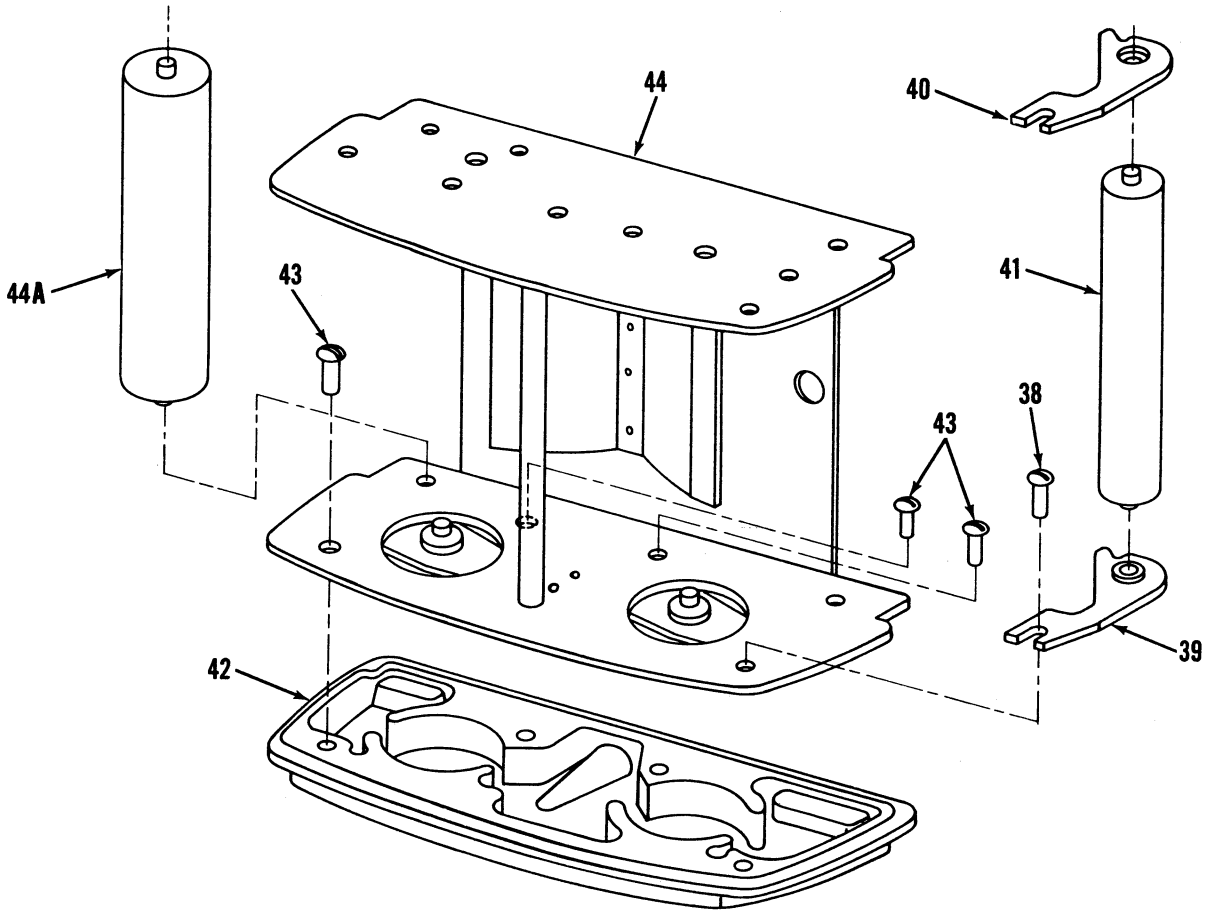

Figure I-2. CARRIAGE COMPLETE, 3RD STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5		MODELS 31797G3	31797G4	31797G5	31797G1	31797G2					
2-38	33921-20L	. Screw, Self Threading (3rd stage Disassembly)	1	x	x	x	x	x					
-39	39603P1	. Guide, Lower	1	x	x	x	x	x					
-40	39603P2	. Guide, Upper	1	x	x	x	x	x					
-41	39604P1	. Roller, Film	1	x	x	x	x	x					
-42	31804P1	. Plate, Bottom	1	x	x	x	x	x					
		(ATTACHING PARTS)											
-43	33921-13L	. Screw, Self Threading	3	x	x	x	x	x					
		---*---											
-44	31798G1	. Carriage Assembly	1	x	x	x	x	x					
-44A	33947P1	. . Roller, Film	1										

SECTION II

A. INTRODUCTION

Section II of this manual provides service instructions for maintenance of the 220, RH 20 Roll Film Holders "23" and "45". Obvious procedures are not stated. The Parts List clearly describes the differences between models.

Note that this Roll Holder contains more Parts than those covered in Section I.

B. DISASSEMBLY

Refer to figure II-1 for disassembly of the Roll Holder Complete. Refer to figure II-2 stages 1, 2 and 3 for disassembly of the Carriage Complete.

C. CLEANING

Refer to Paragraph C Section I.

NOTE

Sun pinion (6, fig. II-2 1st stage) and winding key (40, fig. II-2) must be turned clockwise for diassembly. This is done by setting the dial on a number so the mechanism will lock.

D. REASSEMBLY - CARRIAGE COMPLETE (Figure II-2, stages 1, 2 and 3)

Refer to paragraph F "Lubricants and Adhesives" before starting reassembly procedure.

1. Place one washer (49A) over each bearing end of roller assembly (49B). When assembling roller assembly to carriage assembly (49), spread carriage assembly gently to avoid distortion.

2. Place pinion (39) into its opening and secure in-place with washer (41 & 42) and key (40), turning key counterclockwise. Be sure that washer is not caught between shoulder of pinion and key.

3. Assemble washer (38), ratchet (37) and washer (36) (rounded edge of teeth down) to pinion (39).

4. Place washer (19) on bearing (18). Put bearing into its opening and tape in place. Put screw (10) into its opening and tape in place. (Tape applied over heads of bearing and screw and secured to carriage will hold these items in position.) Assemble support (32) over bearing (18).

5. Place gear (35) and pinion (34) into position, the short shank of pinion (34) through gear (35) and into its opening.

6. Place gear (31) into position (raised side of dimples to face upward). Position gear so smaller blank segment will face pinion (34).

7. Place gear (30) into position, blank segment facing pinion (34) and identification hole positioned as shown. Rotate gear (30) clockwise while maintaining position of gear (31) and expose four teeth of gear (31). The first tooth of gear (30) will cover the fifth tooth of gear (31). Large and small identification holes will be opposite and lay parallel to long dimension of carriage.

8. Place pinion (29) into position engaging teeth of pinion with teeth of gears (30 & 31). Do not disturb placement of gears.

9. Assemble washer (33), spring (28) and lever (27). Be sure hook on spring engages lever. Position on pinion (34).

10. Assemble spacer (26), lever (25), bearing (24), and spring (23). Spring is placed with long shank as shown. Position on bearing (18).

11. Place cam (22) in position shown. Be sure pins on underside of cam engage proper holes in gear (30).

12. Assemble spring (21) over stud on bearing plate assembly (20). Do not distort spring.

13. Thread spring (17) on stud of bearing plate assembly.

14. Place bearing plate assembly (20) in position. (Spring (21) must pass between pinion (29) and cam (22).)

15. Remove tape from bearing (18) and tighten bearing slightly.

16. Pull bottom shank of spring (17) counterclockwise until pawl is tight against ratchet (37) continue pulling shank of spring until it is pointing in opposite direction of top shank and hold in this position for next step.

17. Slide spacer (16) into position; apply pressure on bearing plate to retain spacer. Release spring (17). Insert screw (15) and tighten slightly.

NOTE

Do not allow pawl to slip above or below ratchet during this operation.

Visually check for bearing plate alignment. Cam (22) and ratchet (37) must be flat against underside of bearing plate. Spring (21) must not be caught between pinion (29) and bearing plate. When visually square, tighten bearing (18) and screw (15).

18. Pull straight shank of spring (28) around and behind prong of bearing plate. (Use a paper clip with small hook formed at one end.) Be sure spring of lever (27) lies under cam (22) - nose of lever rides on rim of cam.

19. Engage short shank of spring (23) in hook on lever (25); pull long shank of spring around and behind prong on bearing plate.

20. Anchor loose end of spring (21) into hole of lever (25).

21. Check freedom of gear (30) and pinion (29) by rotating gear clockwise 2 or 3 teeth. Spring forces will return it to previous position if bearing plate is properly aligned.

22. Place top plate (11) in position. Remove tape from head of screw (10), hold head of screw (10) securely in position and assemble dial (9) until it almost touches lugs on cam. Position slots on underside of dial over lugs of cam so the letter "S" on the dial is near the white index line. Tighten screw (10) until slots in dial are pulled down on lugs of cam. Do not tighten completely. Turn pinion (39) until metering mechanism locks on No. 1 position. Align No. 1 on dial with index line and tighten screw (10).

23. Place spring (8) around post of pinion (39) and lower loop of spring around brass stud on bearing plate. Push spring (20A) away from post of pinion (39) and slip spring (8) between post of pinion and spring (20A). Keep pawl on outside of springs.

24. Slide carrier assembly (7) over post of pinion (36) and center spring (8) directly beneath it. Place upper loop of spring around long stud on underside of carrier assembly. Push carrier assembly down and turn counterclockwise approximately 45 until long stud on underside of carrier assembly is in past pawl pivot. Hold in position.

25. Place sun pinion (6) on pinion (39) and turn counterclockwise until tight. Release carrier assembly. To tighten the sun pinion down firmly, insert a screwdriver blade in its teeth and use a post of the carrier assembly as a fulcrum to apply slight pressure.

26. Place ring gear (5) down around outside of carrier assembly. Push pawl in toward pinion (39) and insert a thin object through screw hole in carrier assembly where pawl now appears. Put pressure on pawl to hold it in this position; push ring gear down until it sits evenly on bearing plate. Hold ring gear down and release pawl.

27. Slide planet pinions (4) on posts of carrier assembly, engaging teeth of sun pinion and ring gear.

28. Place lever (3) in position with two flat sided holes engaging posts on carrier assembly. Push lock lever to release position and advance lever (3) until it is in front of its stop pin. Press down, directly over ring gear, until it is seated. Replace cap (1) and two screws (2).

29. Assemble roller (48) to upper and lower guides (46 & 47) with flanged edges of holes on guides in toward roller. Position in carriage assembly.

30. When replacing top plate assembly (11), replace screws (14, 13 and 12) gently. (Do not tighten these screws completely, they are self-threading screws and will rethread the hole and misalign the top plate if forced.)

Lay entire assembly on a flat surface with loading side up and top plate facing left. (Roller assembly (49B) will be in toward repairman.) Hold body of carriage assembly steady and position take-up end of top plate up (away from film plane) and back toward supply end. (This can be done by holding the assembly in the left hand with the thumb on the carriage assembly support bar and the middle finger under the corner of the top plate at the takeup end. Pressure applied by these fingers will hold the top plate in its proper position.) Maintain position of top plate and insert screw (14). Tighten until it retains the upper guide place (do not tighten completely). Insert screw (12) and tighten to approximately two turns loose. Release carriage; apply pressure to position supply end of top plate down (toward film plane) and tighten screw (12) completely. Reapply pressure to position front of top plate up; be sure guide is still in position, and tighten screw (14) completely. Replace screw (13).

31. Inspection and Check

a. With cam (22) and dial (9) disengaged (beyond position 20), rotation of dial in direction of arrow must engage cam after passing second "click" position.

b. Lever (3) must stop in each numbered position and be released by moving lever (28) in direction of arrow. Do not force return of lever to lock position.

c. When mounted in frame assembly, lever (3) must index between exposure stops with a maximum force of 9 inch-ounces of torque with a simulated or real film load.

d. Roller (48) must be as flush with face of carriage assembly (49) as guides (47 & 46) will permit.

F. REASSEMBLY - COVER AND FRAME (Figure 1)

1. Center pin (4) in hinge and pinch hinge over both ends to secure.

2. Cover (6) must hinge freely and latch securely (both catches). Latch must not release when only one catch is operated and must release easily when both catches are operated simultaneously.

E. TROUBLE AND REMEDY TABLE

The purpose of the following table is to list possible repairs and adjustments.

TABLE II-1

TROUBLE	CAUSE	REMEDY
1. Metering mechanism binds or jams.	Bearing plate assembly (20, Fig. II-2) out of alignment.	Realign plate assembly and mechanism components (para. E.).
2. Metering mechanism only partially locks at each number; slightly forcing film advance lever will permit winding to succeeding exposures without stopping.	Ratchet (37, Fig. II-2) reversed.	Reposition (para. E. 3.).
3. Metering mechanism jams after exposure start and before No. 1 position on dial.	Bearing plate (20, Fig. II-2) out of alignment.	Realign plate until dial is free at exposure start.
	Dial was forced into rotation before No. 1 position.	Release lock lever (27, Fig. II-2) and advance lever (3, Fig. II-2).
4. Metering mechanism will not stop after position 20. Dial rotates constantly.	Spring (21, Fig. II-2) unhooked or broken.	Rehook or replace.
	Gears (30 & 31, Fig. II-2) out of synchronization.	Reposition (para. E.).
5. Dial (9, Fig. II-2) does not rotate at exposure start.	Spring (23, Fig. II-2) unhooked or broken.	Rehook or replace.
6. Dial free-wheels at "9" instead of after "20"; numbers not in synchronization with film.	Dial in wrong position in relation to cam.	Rotate dial 180 .
7. Film advance lever (3, Fig. II-2) fails to return.	Spring (8, Fig. II-2) unhooked or broken.	Rehook or replace.
8. Film advance lever does not advance film.	Spring (20A, Fig. II-2) broken.	Replace.
	Pawl on bearing plate assembly (20, Fig. II-2) broken.	Replace bearing plate assembly.
9. Film advance lever binds before completing full swing.	Top plate (11, Fig. II-2) out of adjustment.	Readjust.
10. Lock lever (27, Fig. II-2) does not catch when released from locked position.	Spring on lock lever assembly broken.	Replace lock lever assembly.
11. Film scratch.	Film flattener rollers on frame assembly (5, Fig. II-1) not turning freely.	Lubricate (para. G.).
	Plush lining on tension spring of carriage assembly (45, Fig. II-2) damaged.	Replace carriage assembly.

TABLE II-1 (CONT.)

TROUBLE	CAUSE	REMEDY
12. Film winds through without stopping on numbers.	Spring (28, Fig. II-2) unhooked or broken.	Rehook or replace.
13. Pictures do not start at No. 1 on film.	Spring (23, Fig. II-2) unhooked or broken.	Rehook or replace.
14. Negatives have fogged streaks caused by light leaks.	Screw (12, Fig. II-2) missing.	Replace.
	Light seal (s) (6D, Fig. II-1) damaged.	Replace.
15. Not full number of pictures per roll or in wrong position on roll.	Lock lever assembly (27, Fig. II-2) bent or damaged.	Replace.
	Improper threading.	Refer to Instructions Manual.
16. Winding key turns freely in either direction. (This condition will be noted by lack of ratchet sound when lever is advanced.)	Spring (17, Fig. II-2) unhooked or broken.	Rehook or replace.
17. Back cover does not fit correctly - may or may not close and latch.	Top or bottom plate (11 or 43, Fig. II-2) may be out of alignment with carriage.	Realign plate.
18. Film not flat at take-up end.	Film guides (47 & 46, Fig. II-2) not properly positioned.	Loosen screw (45, Fig. II-2), then loosen screw (14, Fig. II-2) and reposition guides. Do not disturb cover (11, Fig. II-2) adjustment.

F. LUBRICANTS, CLEANING SOLVENTS AND ADHESIVES

Refer to Table I, Section I; the areas specified and references listed for cleaning and lubrication are the same for all roll holders.

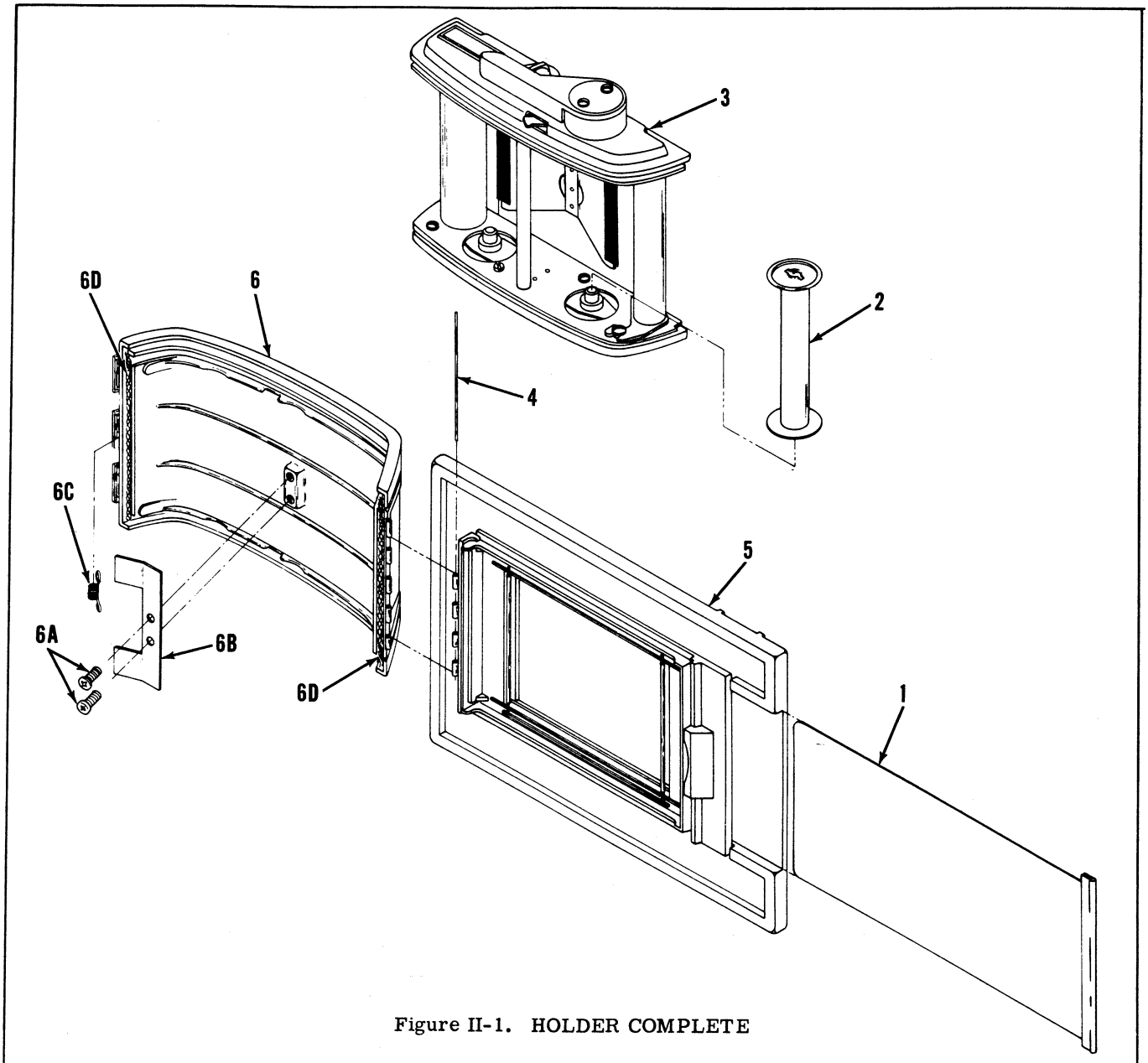

Figure II-1. HOLDER COMPLETE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY
1-	39606G7	Holder Complete - Roll Film (20 exposure - "23") Cat. No. 1258. .	Ref.
	39606G8	Holder Complete - Roll Film (20 exposure - "45") Cat. No. 1259. .	Ref.
-1	39625G3	. Slide Complete ("23") Cat. No. 1432	1
	30649G5	. Slide Complete ("45") Cat. No. 1418	1
-2	31835	. Spool - Film	1
-3	40700G1	. Carriage Complete (Figure 2)	1
-4	30172-30	. Pin - Straight	1
-5	31831G15	. Frame Assembly ("23")	1
	31831G16	. Frame Assembly ("45")	1
-6	31787G6	. Cover Assembly	1
-6A	30921-28L	. . Screw - Self Threading, No. 2 x 3/16 round hd.	2
-6B	31791	. . Spring - Film Pressure	1
-6C	33813	. . Spring - Latch	1
-6D	31787P2	. . Seal - Light (4 ply black yarn)	LP

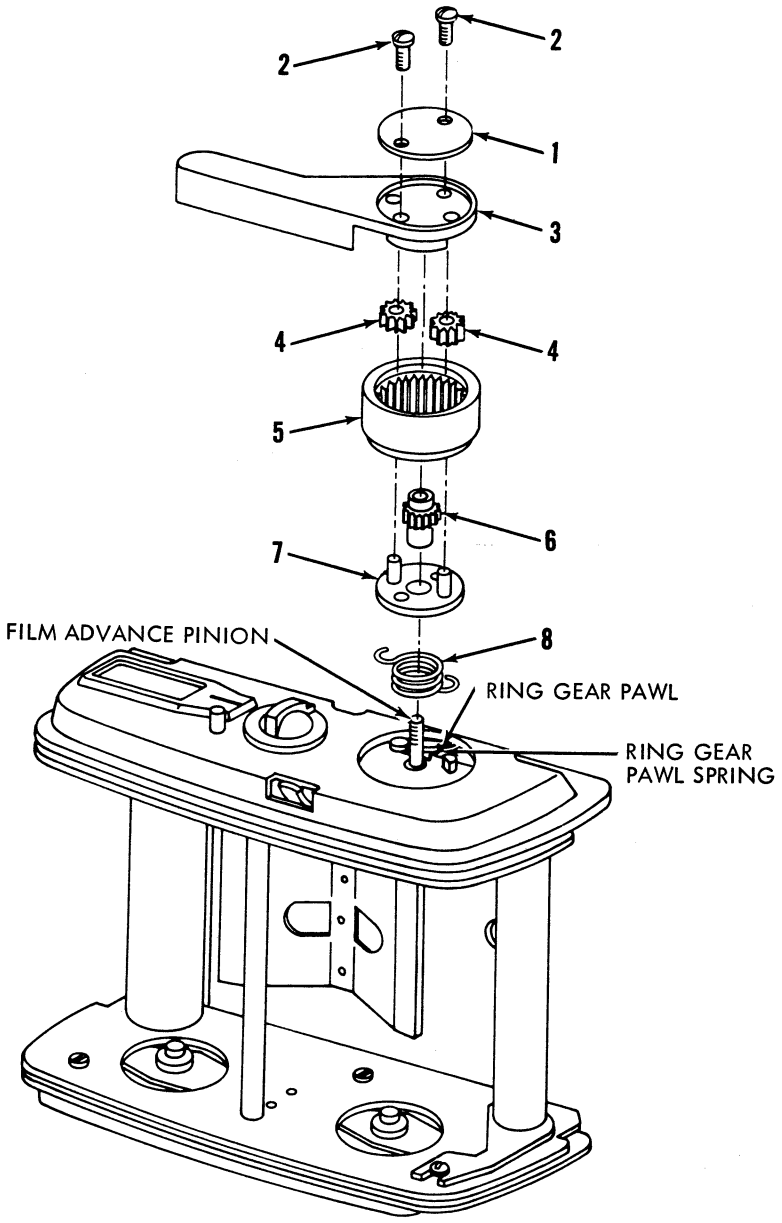

Figure II-2. CARRIAGE COMPLETE, 1ST STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY
2-	40700G1	Carriage Complete	Ref.
-1	39613	. Cap - Film Advance Lever	1
		(ATTACHING PART)	
-2	39622	. Screw - Machine (special)	2
		---***---	
-3	39612P5	. Lever - Film Advance	1
-4	39611P1	. Pinion - Planet	2
-5	39610P1	. Gear - Ring	1
-6	39606P1	. Pinion - Sun	1
-7	39614G1	. Carrier Assembly - Planet Gear	1
-8	39608P1	. Spring - Film Advance Lever	1

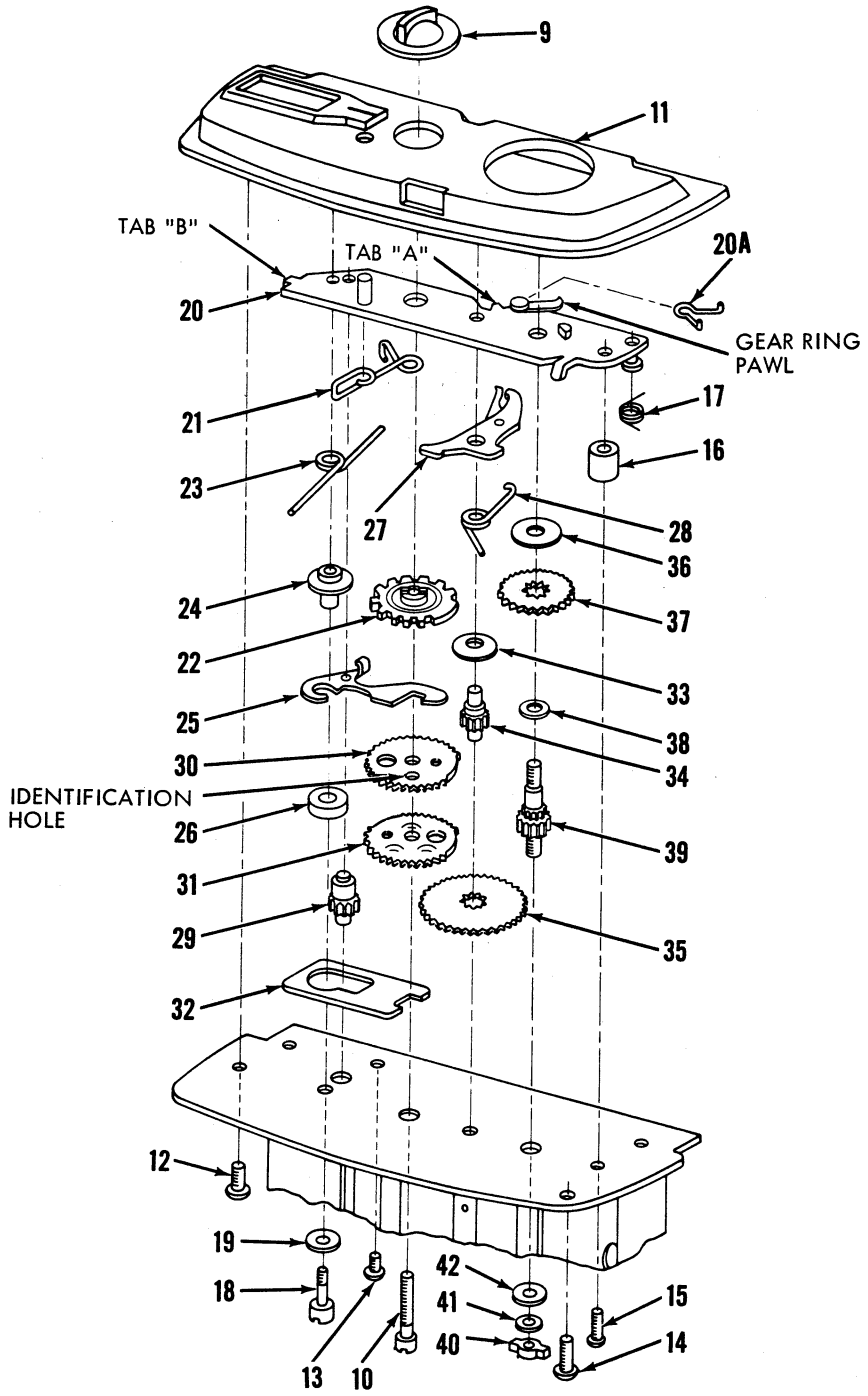

Figure II-2. CARRIAGE COMPLETE, 2ND STAGE

FIG. & INDEX NO.	PART NUMBER	1 2 3 4 5	QTY
2-9	40714P1	. Dial	1
		(ATTACHING PART)	
-10	31834P3	. Screw - Machine (cam bearing)	1
		---***---	
-11	39623G1	. Plate Assembly - Top	1
	31888	. . Panel - Notation	1
		(ATTACHING PARTS)	
-12	33921-13L	. Screw - Self Threading, No. 4 x 1/4 pan hd.	1
-13	33921-1L	. Screw - Self Threading, No. 3 x 3/16 pan hd.	1
-14	33921-23L	. Screw - Self Threading, No. 4 x 3/8 round hd.	1
		---***---	
-15	102-2-6L	. Screw - Machine, No. 2-56 x 3/8 round hd.	1
-16	31809	. Spacer.	1
-17	39605	. Spring - Non Reverse Pawl	1
-18	31826	. Bearing - Spool.	1
-19	30473-41	. Washer - Flat, 0.312 x 0.128 x 0.010	1
-20	31805G3	. Plate Assembly - Bearing	1
-20A	39620	. . Spring - Ring Gear Pawl	1
-21	40712P1	. Spring - Brake	1
-22	31820P4	. Cam	1
-23	31825	. Spring - Engaging Lever	1
-24	40703	. Bearing - Engaging Lever	1
-25	31823P2	. Lever - Counter Engaging	1
-26	40702	. Spacer.	1
-27	31817G1	. Lever Assembly - Lock	1
-28	31816P1	. Spring - Lock Lever	1
-29	40705P1	. Pinion - Idler	1
-30	40706P1	. Gear - Counter	1
-31	40707P1	. Gear - Leader Takeup	1
-32	4071561	. Support	1
-33	38500-14H	. Washer, Flat	1
-34	40704P1	. Pinion - Intermediate	1
-35	31815P2	. Gear - Intermediate	1
-36	40627-15	. Washer, Flat	1
-37	31813P1	. Ratchet - Lock	1
-38	30473-14	. Washer - Flat, 0.312 x 0.129 x 0.010	1
-39	39607P1	. Pinion - Film Advance	1
		(ATTACHING PARTS)	
-40	31811P1	. Key - Winding Spool	1
-41	40627-16	. Washer, Flat	1
-42	30473-41	. Washer - Flat, 0.312 x 0.128 x 0.010	1

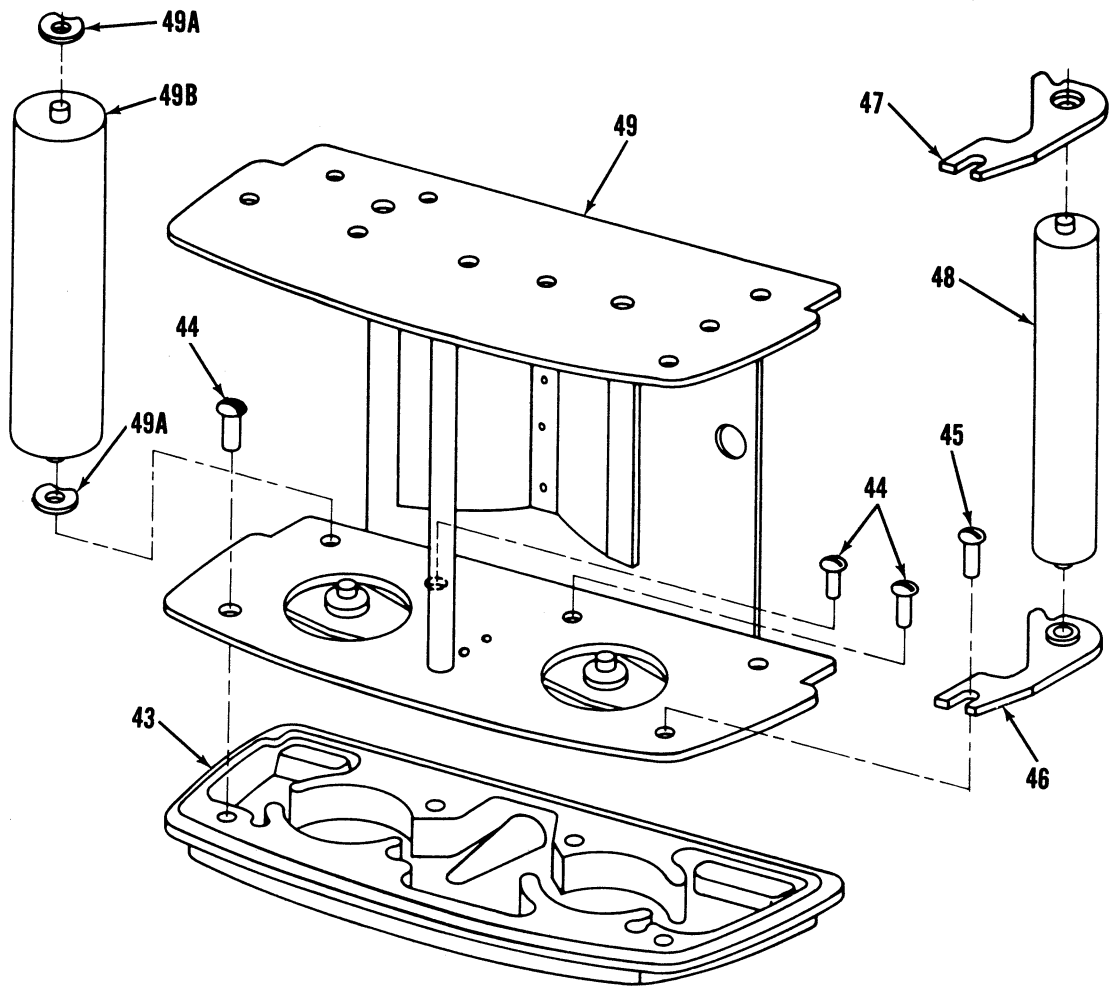

Figure II-2. CARRIAGE COMPLETE, 3RD STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY
2-43	31804P1	. Plate - Bottom	1
		(ATTACHING PARTS)	
-44	33921-13L	. Screw - Self Threading, No. 4 x 1/4 pan hd.	3
-45	33921-23L	. Screw - Self Threading, No. 4 x 3/8 round hd.	1
		---***---	
-46	39603P1	. Guide - Film (lower)	1
-47	39603P2	. Guide - Film (upper)	1
-48	39604P1	. Roller - Film	1
-49	31798G2	. Carriage Assembly	1
-49A	224R13	. . Washer - Spring	2
-49B	40718G1	. . Roller Assembly	1

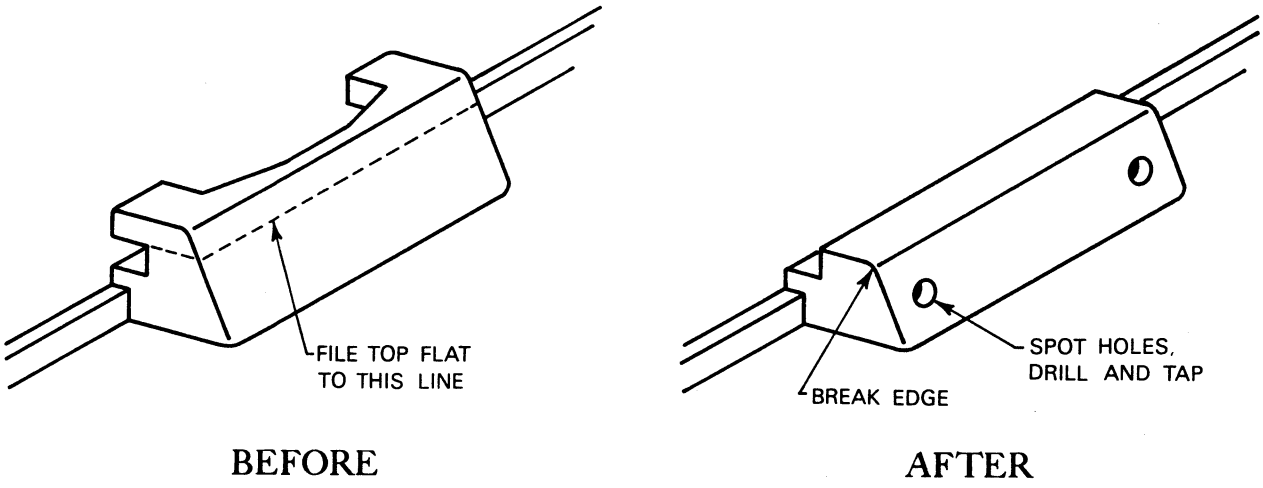

Figure II-3. LATCH REPAIR - ROLL HOLDER FRAME

INDEX NO.	PART NUMBER	NOMENCLATURE	QTY
3-1	SS-306	Latch	1
2	116-4R-4	Screw	2

1. File top of latch flat as in figure II-3 above.
2. Use latch as template - align on spot 2 holes.
3. Spot and drill two holes (size 43).
4. Tap two drilled holes with 4-40 tap.
5. Apply Glyptol on threads of screws and assemble latch SS-306.

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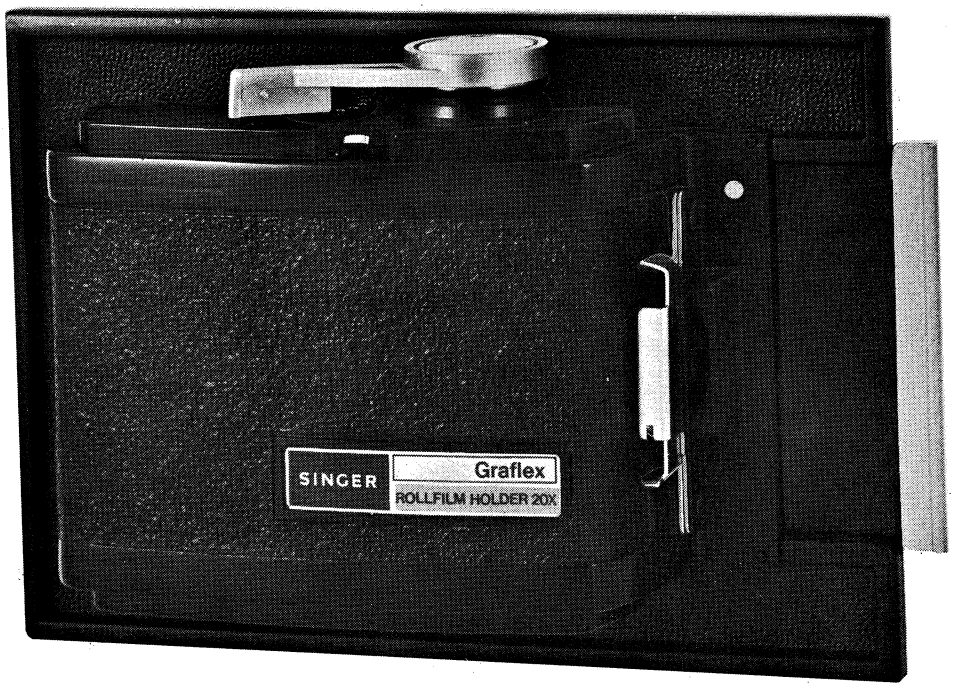

SERVICE INSTRUCTIONS AND PARTS LIST

Graflex

MODEL II

ROLL HOLDERS

SINGER
GRAFLEX DIVISION

THE SINGER COMPANY / GRAFLEX DIVISION, ROCHESTER, NEW YORK

ROLL HOLDER
MODEL II

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SECTION II

LIST OF ILLUSTRATIONS

ROLL HOLDER
MODEL II

SECTION I

A. INTRODUCTION

This manual provides service instructions for repair of Graflex Lever Advance Model II Roll Holders. Obvious procedures are not stated. The parts list clearly describes the differences between models.

B. DISASSEMBLY

Disassemble Roll Film Holder complete in accordance with figure 1. The index numbers are in disassembly sequence. Disassemble the Carriage Complete in accordance with figure 2 - 1st, 2nd, and 3rd stages. Refer to the following which pertains to disassembly procedures.

CAUTION

The machine screw (30), exposure dial (11), winding key (36), all have left hand threads and must be turned in a clockwise direction to remove.

NOTE

Lubrication needed only on reassembly.

C. CLEANING

Clean the disassembled parts as follows:

WARNING

Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; do not use near flame. Avoid contact with the skin; wash off any that spills on the hands.

1. Clean the unpainted metal mechanical parts with chlorothene. Dry the cleaned parts thoroughly; use a clean lint free cloth or a gentle blast of compressed air. When cleaning parts of the carriage mechanism such as gears and levers, use a small brush moistened with the cleaning compound to clean the parts thoroughly.

2. Wipe painted metal parts with a soft, lint free cloth moistened with cleaning compound. Thoroughly dry the cleaned parts with a dry, lint free cloth.

3. Clean plastic parts with a damp cloth and mild soap and water. Dry thoroughly with a soft, lint free cloth.

D. REASSEMBLY

Reassemble in accordance with the procedures that follow. All parts requiring lubrication and adhesives are listed in paragraph F.

CAUTION

Prior to reassembling the parts of the Roll Holder, refer to Table 2 to insure all parts requiring lubrication during reassembly are properly lubricated.

1. Position plate assembly (41) on carriage assembly (44), position spring (40) on bottom plate (39), attach bottom plate to carriage and secure with three screws (42) and screw (43).

2. Position film advance pinion (35) into its mounting hole. Assemble large flat washer (38), small flat washer (37) to bottom of pinion and secure with winding key (36).

CAUTION

The winding key (36) has left hand threads and must be turned in a counterclockwise direction to assemble.

3. Assemble lock ratchet (34) and flat washer (33) on film advance pinion (35).

CAUTION

When assembling the lock ratchet (34), rounded side of teeth must face downward.

4. Position intermediate gear (32) over its mounting hole so that a tooth in the gear is in mesh with a tooth on the film advance pinion (35). Insert the short end of the intermediate pinion (31) through hole in the intermediate gear and into its mounting hole in the carriage.

CAUTION

When assembling the intermediate gear (32) rounded side of teeth must face downward.

5. Insert machine screw (30) through hole in carriage and apply a piece of tape over the head of screw to hold screw in place. Assemble the counter gear (29) over the machine screw with blank segment on gear facing the intermediate pinion (31) and the identification hole dressed perpendicular to the rear surface of the carriage. Assemble cam (28) locating the large and small studs on bottom of cam into mating holes in the counter gear (29). Cam must seat flat on the counter gear.

CAUTION

When assembling the counter gear (29) rounded side of teeth must face downward.

6. Assemble flat washer (27) on spool bearing (26); insert spool bearing through hole in carriage. Apply a piece of tape over the head of bearing to hold bearing in place. Assemble spacer (25), counter engaging lever (24), engaging lever bearing (23) and engaging lever spring (22). Short shank of spring must face downward and locate against the tab on counter engaging lever.

7. Attach the hook end of the lock lever spring (21) onto side of lock lever assembly (20). Assemble lock lever assemby (with lock lever spring attached) over the intermediate pinion (31). Position the lock lever to locate the spring portion of the lever under cam (28) and the lever portion on the blank surface of the cam.

8. If removed, assemble ring gear pawl spring (19a) under the ring gear pawl. The two formed ends of the spring should locate on the rear side of the pawl.

9. Carefully position the bearing plate assembly (19) over the carriage mechanism. Check the lock lever spring (21), making sure the hook end engages the lock lever assembly (20). Remove tape securing spool bearing (26) and thread bearing into its mounting hole in the bearing plate assembly. If removed, thread the non-reverse pawl spring (18) over stud on bottom side of the bearing plate assembly. Wind the bottom shank of the non-reverse pawl spring in a counterclockwise direction until it forces the non-reverse pawl, riveted to the bottom side of the bearing plate assembly, to locate against the lock ratchet (34). Continue winding the bottom shank of the spring until it is pointing outward; slide spacer (17) in place. Apply downward pressure on bearing plate assembly to retain spacer. Release the spring and secure spacer by inserting machine screw (16) up through hole in carriage, through spacer, and thread screw into its tapped hole in bearing plate assembly.

10. With the short shank of the engaging lever spring (22) against the tab on counter engaging lever (24), wind long shank of spring in a clockwise direction and locate it behind Tab B on the bearing plate assembly (19). Use a paper clip with a small hook on the end to wind the straight shank of the lock lever spring (21) in a counterclockwise direction and locate it behind Tab A on the bearing plate assembly (19).

11. Position the top plate assembly (12) over the bearing plate assembly (19). Remove tape securing machine screw (30); hold screw in place. Thread the exposure dial (11) onto machine screw until keyway on dial is opposite the key on cam (28) and the letter S on dial is near the index mark on the top plate assembly. Tighten machine screw.

12. Position upper roller guide and secure in place with screw (15). Fasten top plate in place with screws (13 and 14).

13. Position the ring gear pawl and ring gear pawl spring away from the film advance pinion. Assemble the film advance lever spring (10) over the film advance pinion with bottom loop of the spring over the milled stud on the bearing plate assembly.

14. Position the planet gear carrier assembly (9) on the film advance pinion with the large stud on the bottom of the carrier assembly located in the upper loop of the film advance lever spring (10).

15. Assemble flat washer (8), sun pinion (7) on film advance pinion and secure in place with retaining ring (6).

16. Use a paper clip or a small tool to push the ring gear pawl clockwise under the planet gear carrier assembly (9) and hold in place. Use a small tool inserted through screw hole in the carrier assembly and hold the ring gear pawl toward the film advance pinion. While holding the pawl, slide the ring gear (5) down over the tool; seat the ring gear in place and withdraw the tool. The ring gear pawl and the ring gear pawl spring should locate within the ring gear as shown in Diagram A.

17. Assemble a planet pinion (4) to each of the two posts on the planet gear carrier assembly (9).

18. Assemble film advance lever (2), and secure with two machine screws (3). Reactivate cement on cap (1) and fasten in place.

19. Operate the carriage mechanism thru several simulated "exposures" to allow for self alignment of the gears, bearing plate and top plate assembly. If binding occurs, apply pressure at either end of the top plate assembly and shift it slightly until smooth operation is obtained. Apply a small drop of Glyptol around the heads of screws and to screw notches of the upper and lower guides.

ROLL HOLDER
MODEL II

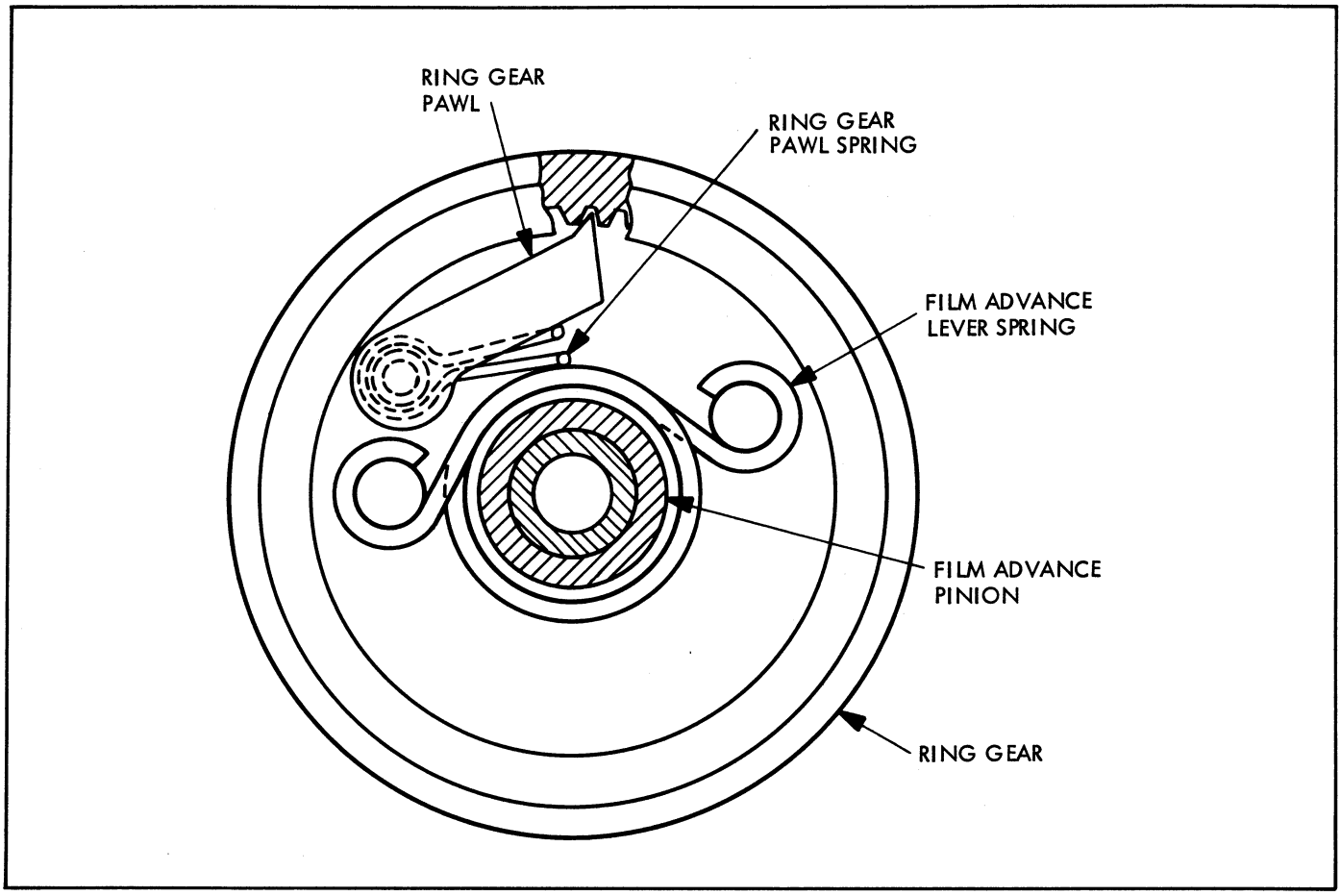

Diagram A

E. TROUBLE AND REMEDY TABLE

The purpose of the following table is to list possible repairs and adjustments.

Before disassembling the Roll Holder, check for loose or missing screws, or parts that are binding because of misalignment or lack of lubrication.

TABLE I-1

MODEL	TROUBLE	CAUSE	REMEDY
Both	Lock lever does not catch when released from locked position	Defective lock lever assembly (20, fig. 2, 2nd stage) broken	Replace lock lever assembly
Both	Metering mechanism binds or jams	Bearing plate assembly (19, fig. 2, 2nd stage) out of alignment	Realign plate assembly and mechanism components
Both	Negative not sharp - one side or generally; and/or fogged streaks caused by light leaks	Screw 26, fig. 2, 2nd stage missing	Replace screw
		Light seal at end of cover damaged	Replace light seal, cement in place with EC-880 cement
		Slide damaged	Replace slide

TABLE I-1 (CONT.)

TROUBLE	CAUSE	REMEDY
Pictures do not start at No. 1 (on film)	Spring (22, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Dial does not rotate at exposure start		
Not full number of pictures per roll or in wrong position on roll	Lock lever assembly (20, fig. 2, 2nd stage) bent or damaged	Replace lock lever
	Improper threading	See loading instructions
At end of roll, dial moves back and forth between "12", "10", or "8" and "S"	Lock lever assembly binding	Lubricate plate assembly
Film winds through without stopping on numbers	Spring (21, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Dial free-wheels at #1, #2, or #3 instead of #8, #10, or #12; numbers not in synchronization with film	Dial in wrong position in relation to cam	Rotate dial 180°
Dial only partially locks at each number; slightly forcing film advance lever (or winding knob) will permit winding to succeeding exposures without stopping	Ratchet (34, fig. 2, 2nd stage) reversed, rounded edge faces toward plate assembly	Reverse ratchet
Winding key (and/or knob) turns freely in either direction	Spring (18, fig. 2, 2nd stage) broken or unhooked	Rehook or replace spring
Back cover does not fit correctly - may not close and latch	Top or bottom plate (12 or 19, fig. 2, 2nd stage) out of alignment with carriage	Realign plate
Film advance lever fails to return	Return spring (10, fig. 2 1st stage) broken or unhooked	Rehook or replace spring
Film advance lever fails to advance film	Spring or pawl on bearing plate assembly (19, fig. 2, 2nd stage) broken	Replace spring or plate assembly
Film advance lever binds before completing full swing	Top plate (12, fig. 2, 2nd stage) out of adjustment	Readjust plate
Film scratch	Film flattener rollers not turning freely	Lubricate with dry molykote and alcohol

F. LUBRICANTS, CLEANING SOLVENTS, AND ADHESIVES

TABLE I-2

COMPOUND	MANUFACTURER	USE OR APPLICATION
LUBRICANTS:		
		Figure I-2 & II-2, 1st stage:
Texaco Unite mp ANG-25-AM2 (39484-P3)	Texaco	Outside diameter and center hole and center hole of planet gear carrier assembly (9), teeth of sun pinion (7), bearing diameter of ring gear (5), and teeth of two planet pinions (4).
		Bearing surfaces of film advance lever (2).
		Figure I-2, 2nd stage:
		Bearing diameters of film advance pinion (35), and all bearing surfaces on plate assembly (19).
		Figure II-2, 2nd stage:
		Bearing diameters of film advance pinion (40), and all bearing surfaces on plate assembly (22).
		Figure I-2, 3rd stage:
		All gear and pinion bearing contact surfaces on item (44).
		Figure II-2, 3rd stage:
		All gear and pinion bearing contact surfaces on item (49).
		Figure I-2, 3rd stage:
Neolube (39484-P4)	Huron Industries Huron, Mich.	Bearing ends of rollers (part of carriage 44).
		Figure II-2, 3rd stage:
		Bearing ends of rollers (part of carriage 49).
CLEANING SOLVENTS:		
Chlorothene	Dow Corning Corp. Midland, Mich.	All metal parts

TABLE I-2 (CONT.)

COMPOUND	MANUFACTURER	USE OR APPLICATION
ADHESIVES:		
EC-880 (39491-P13)	Minnesota Mining and Mfg. Co.	Light seal to cover assembly
Glyptol ZV-903 cement (39490-P1) Purple	General Electric	Threads of screw (3, figure I-2, 1st stage). Threads of screw (3, figure II-2, 1st stage).
Glyptol ZV-903 cement (39490-P2) Clear	General Electric	Heads of screws (16 and 26, figure I-2, 2nd stage) Heads of screws (17 and 20, figure II-2, 2nd stage)

G. ILLUSTRATED PARTS LIST

The parts lists following are presented in the order of disassembly. Each parts list is arranged in five columns that include "Figure & Index No.", "Part Number", "Nomenclature", "Qty", and Model Code. An explanation of the information in each column follows:

Figure & Index No. - The Figure & Index No. column contains a list of index numbers that are keyed to the accompanying illustrations. The figure to which the index numbers apply are listed at the top of the column on each page containing a parts list. DO NOT use the figure or index number in correspondence - specify the catalog or part number and name.

Part Number - The Part Number column contains the number that is to be used for ordering parts. When there is more than one number for a part, both numbers are listed and only one index number is provided. The models or subassemblies to which the part numbers apply are covered by the Model Code column.

Nomenclature - The Nomenclature column contains the name of the part which should also be included with the part number when ordering parts. The nomenclature column also shows the relationship between assemblies, subassemblies, and detail parts. All parts common to an assembly or subassembly are indented one space and are listed directly under the item. Assemblies or subassemblies that are shown disassembled are not indexed.

Main assemblies and subassemblies that are not disassembled in the list are indexed and shown in their order of removal from the holder. The Nomenclature column contains a reference to the figure where the parts of the subassembly are disassembled.

Attaching parts are shown throughout the parts lists by the use of the words "ATTACHING PARTS" in the Description column. The end of a listing of attaching parts is denoted by ---*---.

Qty - The Qty column lists the total quantity of parts used in the holder. When the quantity varies for different models, the part is listed more than once and the different quantity is given.

Model Code - The Model Code column denotes the model or subassembly to which each part in the list applies. The model numbers or part numbers which the list covers are listed at the top of the column. The applicability of parts to each model is then indicated by x in the model column.

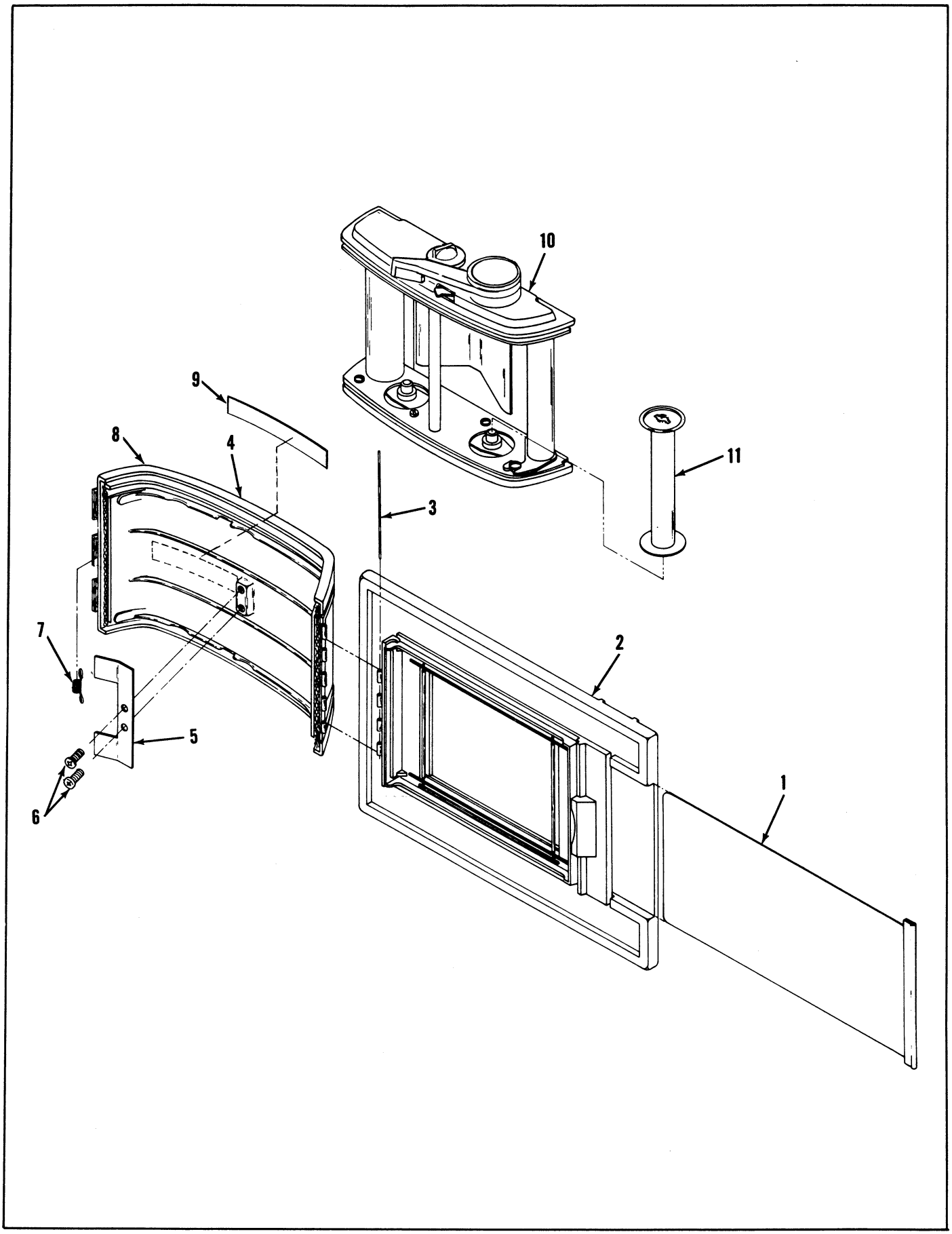

Figure I-1. HOLDER COMPLETE

ROLL HOLDER
MODEL II

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 43116G1	43116G2	43116G3	43116G5	43116G6	43116G7
I-1-	43116G1	Holder, Complete (8 Exposure "23") Cat. #1290	ref	x					
	43116G2	Holder, Complete (10 Exposure "23") Cat. #1291	ref		x				
	43116G3	Holder, Complete (12 Exposure "23") Cat. #1292	ref			x			
	43116G5	Holder, Complete (8 Exposure "45") Cat. #1294	ref				x		
	43116G6	Holder, Complete (10 Exposure "45") Cat. #1295	ref					x	
	43116G7	Holder, Complete (12 Exposure "45") Cat. #1296	ref						x
-1	30649G3	. Slide Complete Cat. #1432	1	x	x	x			
	30649G5	. Slide Complete Cat. #1418	1				x	x	x
-2	43125G1	. Frame Assembly	1	x					
	43125G2	. Frame Assembly	1		x				
	43125G3	. Frame Assembly	1			x			
	43125G5	. Frame Assembly	1				x		
	43125G6	. Frame Assembly	1					x	
	43125G7	. Frame Assembly	1						x
-3	30172-30	. Pin, Straight	1	x	x	x	x	x	x
-4	43118G1	. Cover Assembly	1	x	x	x	x	x	x
-5	31791	. . Spring, Film Pressure (ATTACHING PART)	1						
-6	30921-28L	. . Screw, Self Threading ---*---	2						
-7	33813	. . Spring, Latch	1						
-8	31787P2	. . Seal Latch	2						
-9	43111P1	. Nameplate.	1	x			x		
	43111P2	. Nameplate.	1		x			x	
	43111P3	. Nameplate.	1			x			x
-10	43114G1	. Carriage Complete (Figure I-2)	1	x			x		
	43114G2	. Carriage Complete (Figure I-2)	1		x			x	
	43114G3	. Carriage Complete (Figure I-2)	1			x			x
-11	31835	. . Spool, Film	1	x	x	x	x	x	x

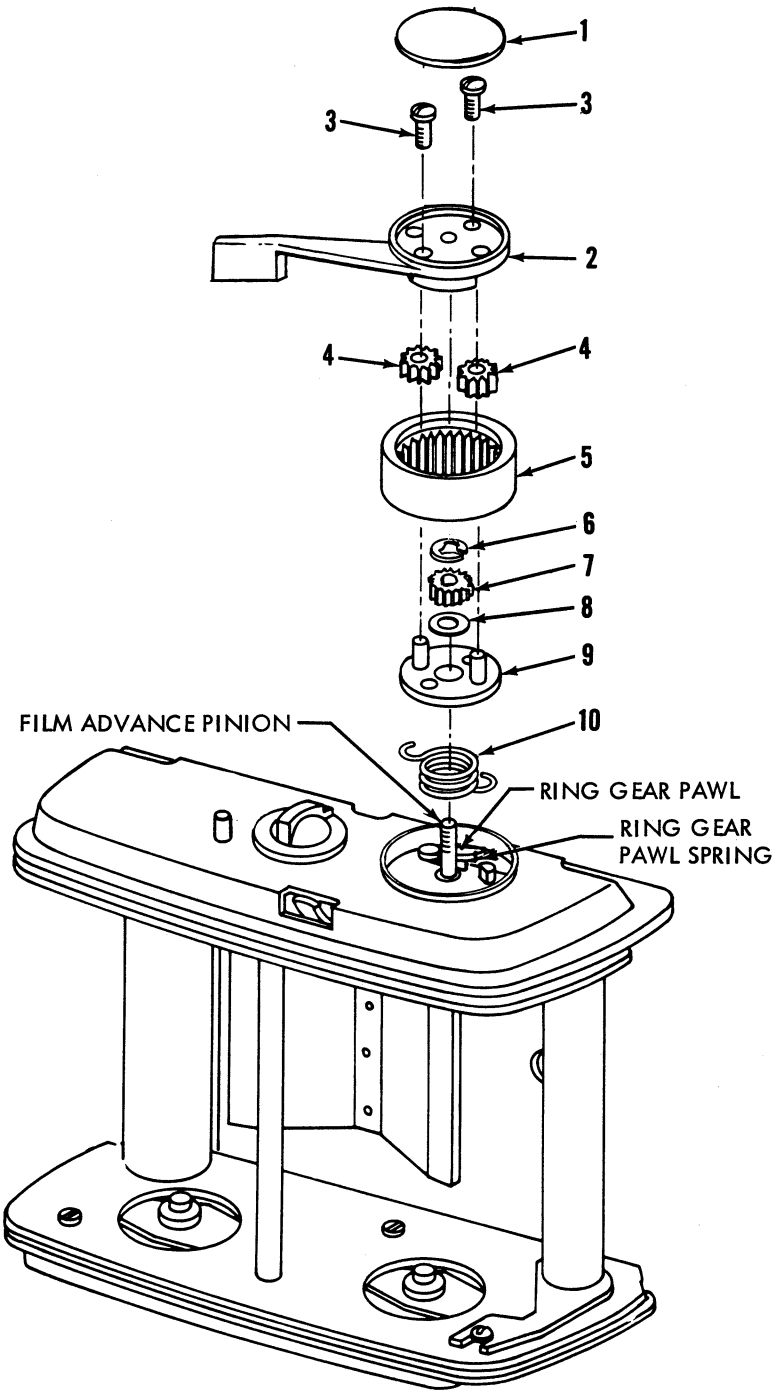

Figure I-2. CARRIAGE COMPLETE, 1ST STAGE

ROLL HOLDER
MODEL II

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 43114G1	43114G2	43114G3
I-2-	43114G1	Carriage Complete (8 Exposure)	1	x		
	43114G2	Carriage Complete (10 Exposure)	1		x	
	43114G3	Carriage Complete (12 Exposure)	1			x
-1	43109	. Insert	1	x	x	x
-2	43108	. Lever	1	x	x	x
		(ATTACHING PARTS)				
-3	111-4-5L	. Screw Mach. No. 4 x 5/16	2	x	x	x
		---*---				
-4	39611P1	. Pinion, Planet	2	x	x	x
-5	39610P2	. Gear, Ring	1	x	x	x
-6	251-5-1	. Ring, Retaining	1	x	x	x
-7	43100P1	. Pinion, Sun	1	x	x	x
-8	30473-72	. Washer, Flat 0.203 x 0.130 x 0.005	AR	x	x	x
-9	39614G2	. Carrier Assembly	1	x	x	x
-10	39608P1	. Spring	1	x	x	x

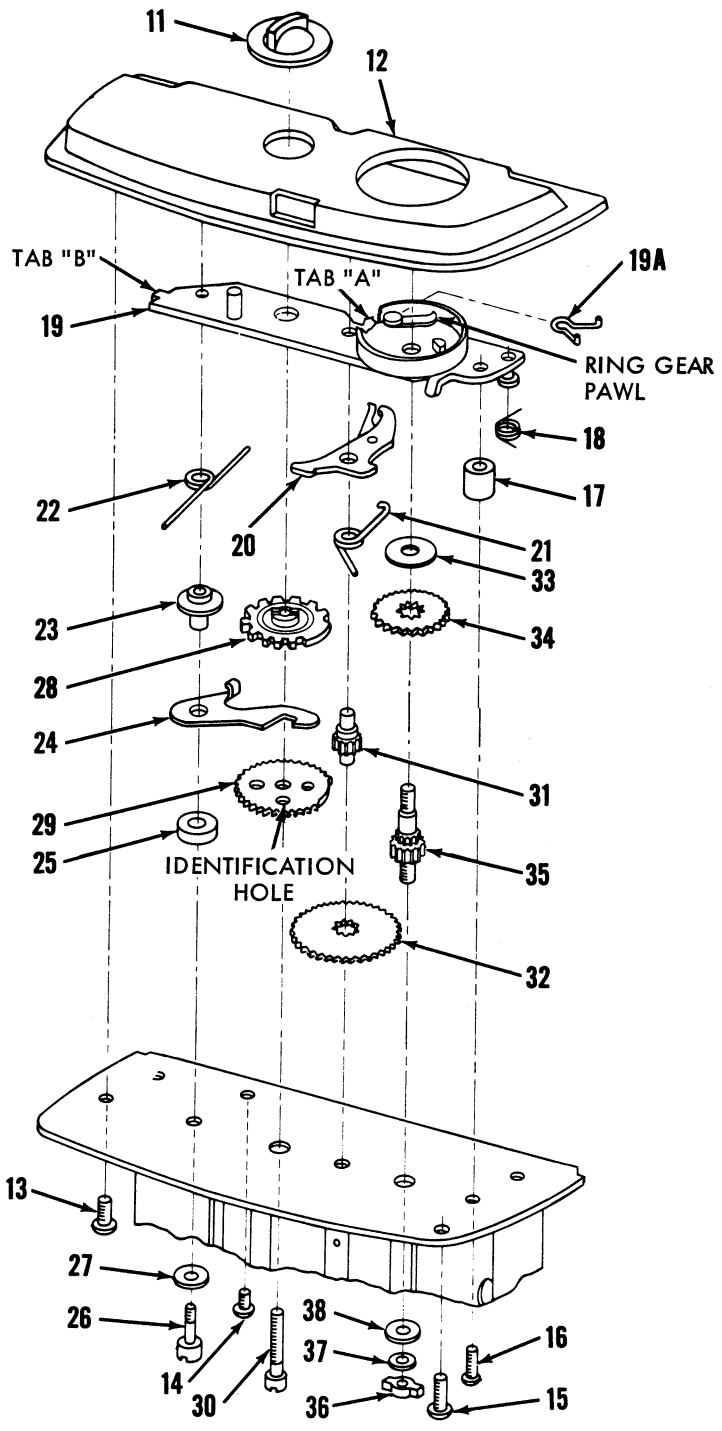

Figure I-2. CARRIAGE COMPLETE, 2ND STAGE

ROLL HOLDER
MODEL II

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 43114G1	43114G2	43114G3
I-2-						
-11	31828P4	. Dial Left Hand Thrd. 8 Exposure	1	x		
	31828P6	. Dial Left Hand Thrd. 10 Exposure	1		x	
	31828P5	. Dial Left Hand Thrd. 12 Exposure	1			x
-12	43124P1	. Plate, Top	1	x	x	x
		(ATTACHING PARTS)				
-13	33921-13L	. Screw 0.112 x 0.250 Pan Hd.	1	x	x	x
-14	33921-1L	. Screw 0.099 x 0.170 Pan Hd.	1	x	x	x
-15	137-4-6L	. Screw No. 4 x 0.312 Pan Hd.	1	x	x	x
		---*---				
-16	43105	. Screw, Special	1	x	x	x
-17	31809	. Spacer.	1	x	x	x
-18	39605	. Spring	1	x	x	x
-19	43123G1	. Plate Assembly	1	x	x	x
-19A	39620	. . Spring	1	x	x	x
-20	31817G1	. Lever Assembly	1	x	x	x
-21	31816P1	. Spring	1	x	x	x
-22	31825	. Spring	1	x	x	x
-23	31822	. Bearing	1	x	x	x
-24	31823P1	. Lever	1	x	x	x
-25	31824	. Spacer	1	x	x	x
-26	31826	. Bearing	1	x	x	x
-27	41846-1	. Washer, Flat 0.312 x 0.093 x 0.010	1	x	x	x
-28	31820P1	. Cam	1	x		
	31820P3	. Cam	1		x	
	31820P2	. Cam	1			x
-29	31821P1	. Gear.	1	x	x	x
-30	31834P4	. Screw - Special Left Hand Thrd.	1	x	x	x
-31	31814P1	. Pinion	1	x	x	x
-32	31815P1	. Gear.	1	x	x	x
-33	40627-15	. Washer 0.500 x 0.160 x 0.010	1	x	x	x
-34	31813P1	. Ratchet	1	x	x	x
-35	43101P1	. Pinion	1	x	x	x
-36	31811P1	. Key - Left Hand Thrd.	1	x	x	x
-37	40627-16	. Washer 0.180 x 0.101 x 0.010	1	x	x	x
-38	30473P41	. Washer 0.312 x 0.130 x 0.010	1	x	x	x

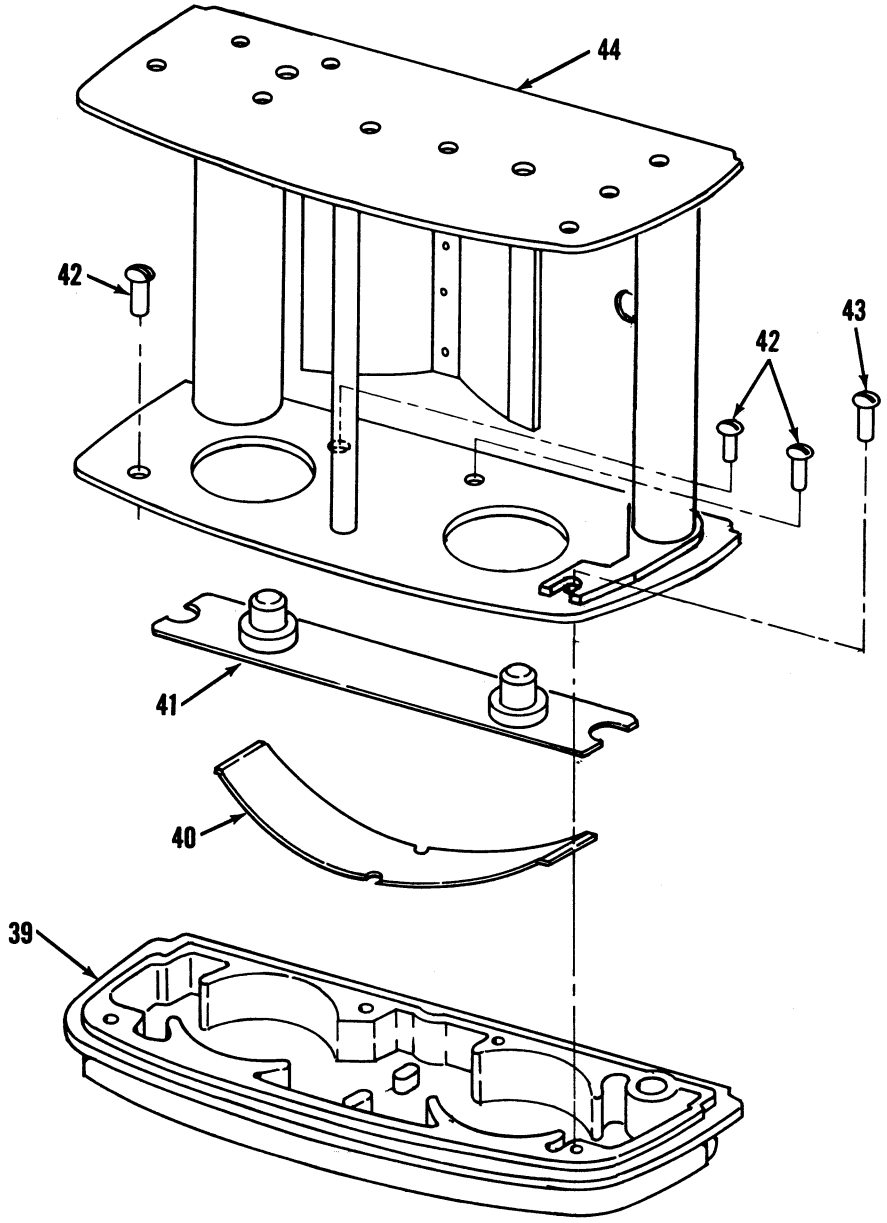

Figure I-2. CARRIAGE COMPLETE, 3RD STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 43114G1	 43114G2	 43114G3
I-2-						
-39	43122P1	. Plate, Bottom	1	x	x	x
-40	43110P1	. Spring	1	x	x	x
-41	43112G1	. Plate Assembly, Spool Bearing	1	x	x	x
		(ATTACHING PARTS)				
-42	33921-13L	. Screw 0.112 x 0.250 Pan Hd.	3	x	x	x
-43	137-4-6L	. Screw No. 4 x 0.312 Pan Hd.	1	x	x	x
		---*---				
-44	43120G1	. Carriage Assembly	1	x	x	x

SECTION II

A. INTRODUCTION

Section II of this manual provides service instructions for maintenance of the 220, RH 20 Model II Roll Film Holders "23" and "45". Obvious procedures are not stated. The Parts List clearly describes the differences between models.

Note that this Roll Holder contains more Parts than those covered in Section I.

B. DISASSEMBLY

Refer to figure II-1 for disassembly of the Roll Holder Complete. Refer to figure II-2 stages 1, 2 and 3 for disassembly of the Carriage Complete.

C. CLEANING

Refer to Paragraph C Section I.

NOTE

Winding key (41, fig. II-2) must be turned clockwise for disassembly. This is done by setting the dial on a number so the mechanism will lock.

D. REASSEMBLY - CARRIAGE COMPLETE (Figure II-2, stages 1, 2 and 3)

Refer to paragraph F "Lubricants and Adhesives" before starting reassembly procedure.

1. Position plate assembly (46) on carriage assembly (49), position spring (45) on bottom plate (44), attach bottom plate to carriage and secure in place with three screws (47) and one screw (48).

2. Place pinion (40) into its opening and secure in place with washers (43 & 42) and key (41), turning key counterclockwise. Be sure that washer is not caught between shoulder of pinion and key.

3. Assemble ratchet (39) and washer (38) (rounded edge of teeth down) to pinion (40).

4. Place washer (21) on bearing (20). Put bearing into its opening and tape in place. Put screw (12) into its opening and tape in place. (Tape applied over heads of bearing and screw and secured to carriage will hold these items in position.) Assemble support (34) over bearing (20).

5. Place gear (37) and pinion (36) into position, the short shank of pinion (36) through gear (37) and into its opening.

6. Place gear (33) into position (raised side of dimples to face upward). Position gear so smaller blank segment will face pinion (36).

7. Place gear (32) into position, blank segment facing pinion (36) and identification hole positioned as shown. Rotate gear (32) clockwise while maintaining position of gear (33) and expose four teeth of gear (33). The first tooth of gear (32) will cover the fifth tooth of gear (33). Large and small identification holes will be opposite and lay parallel to long dimension of carriage.

8. Place pinion (31) into position engaging teeth of pinion with teeth of gears (32 & 33). Do not disturb placement of gears.

9. Assemble washer (35), spring (30) and lever (29). Be sure hook on spring engages lever. Position on pinion (36).

10. Assemble spacer (28), lever (27), bearing (26), and spring (23). Spring is placed with long shank as shown. Position on bearing (20).

11. Place cam (24) in position shown. Be sure pins on underside of cam engage proper holes in gear (32).

12. Assemble spring (25) over stud on bearing plate assembly (22). Do not distort spring.

13. Thread spring (19) on stud of bearing plate assembly.

14. Place bearing plate assembly (22) in position. (Spring (23) must pass between pinion (31), and cam (24).)

15. Remove tape from bearing (20) and tighten bearing slightly.

16. Pull bottom shank of spring (19) counterclockwise until pawl is tight against ratchet (39) continue pulling shank of spring until it is pointing in opposite direction of top shank and hold in this position for next step.

17. Slide spacer (18) into position; apply pressure on bearing plate to retain spacer. Release spring (19). Insert screw (17) and tighten slightly.

NOTE

Do not allow pawl to slip above or below ratchet during this operation.

Visually check for bearing plate alignment. Cam (24) and ratchet (39) must be flat against underside of bearing plate. Spring (23) must not be caught between pinion (31) and bearing plate. When visually square, tighten bearing (20) and screw (17).

18. Pull straight shank of spring (30) around and behind prong of bearing plate. (Use a paper clip with small hook formed at one end.) Be sure spring of lever (29) lies under cam (24) - nose of lever rides on rim of cam.

19. Engage short shank of spring (25) in hook on lever (27); pull long shank of spring around and behind prong on bearing plate.

20. Anchor loose end of spring (23) behind tab B.

21. Check freedom of gear (32) and pinion (31) by rotating gear clockwise 2 or 3 teeth. Spring forces will return it to previous position if bearing plate is properly aligned.

22. Place top plate (13) in position. Remove tape from head of screw (12), hold head of screw (12) securely in position and assemble dial (11) until it almost touches lugs on cam. Position slots on underside of dial over lugs of cam so the letter "S" on the dial is near the white index line. Tighten screw (12) until slots in dial are pulled down on lugs of cam. Do not tighten completely. Turn pinion (40) until metering mechanism locks on No. 1 position. Align No. 1 on dial with index line and tighten screw (12).

23. Position upper roller guide and secure with screw (16). Secure top plate with screws (14 and 15).

24. When replacing top plate assembly (13), replace screws (14, 15 and 16) gently. (Do not tighten these screws completely, they are self-threading screws and will rethread the hole and misalign the top plate if forced.)

25. Place spring (10) around post of pinion (40) and lower loop of spring around brass stud on bearing plate. Push spring (22A) away from post of pinion (40) and slip spring (10) between post of pinion and spring (22A). Keep pawl on outside of springs.

26. Slide carrier assembly (9) over post of pinion (40) and center spring (10) directly beneath it. Place upper loop of spring around long stud on underside of carrier assembly. Push carrier assembly down and turn counterclockwise approximately 45 until long stud on underside of carrier assembly is in past pawl pivot. Hold in position.

27. Assemble washer (8), sun pinion (7) on pinion (40) and retain in place with retaining ring (6).

28. Place ring gear (5) down around outside of carrier assembly. Push pawl in toward pinion (40) and insert a thin object through screw hole in carrier assembly where pawl now appears. Put pressure on pawl to hold it in this position; push ring gear down until it sits evenly on bearing plate. Hold ring gear down and release pawl.

29. Slide planet pinions (4) on posts of carrier assembly, engaging teeth of sun pinion and ring gear.

30. Place lever (2) in position with two flat sided holes engaging posts on carrier assembly. Push lock lever to release position and advance lever (2) until it is in front of its stop pin. Press down, directly over ring gear, until it is seated, and secure with two screws (3).

31. Reactivate cement on cap (1) and fasten into place.

32. Inspection and Check

a. With cam (24) and dial (11) disengaged (beyond position (20), rotation of dial in direction of arrow must engage cam after passing second "click" position.

b. Lever (2) must stop in each numbered position and be released by moving lever (29) in direction of arrow. Do not force return of lever to lock position.

c. When mounted in frame assembly, lever (2) must index between exposure stops with a maximum force of 9 inch-ounces of torque with a simulated or real film load.

33. Reassembly - Cover and Frame (Figure II-1)

a. Center pin (3) in hinge and pinch hinge over both ends to secure.

b. Cover (4) must hinge freely and latch securely (both catches). Latch must not release when only one catch is operated and must release easily when both catches are operated simultaneously.

E. TROUBLE AND REMEDY TABLE

The purpose of the following table is to list possible repairs and adjustments.

TABLE II-1

TROUBLE	CAUSE	REMEDY
1. Metering mechanism binds or jams.	Bearing plate assembly (22, Fig. II-2) out of alignment.	Realign plate assembly and mechanism components (para. E.).
2. Metering mechanism only partially locks at each number; slightly forcing film advance lever will permit winding to succeeding exposures without stopping.	Ratchet (39, Fig. II-2) reversed.	Reverse ratchet.
3. Metering mechanism jams after exposure start and before No. 1 position on dial.	Bearing plate (22, Fig. II-2) out of alignment.	Realign plate until dial is free at exposure start.
	Dial was forced into rotation before No. 1 position.	Release lock lever (29, Fig. II-2) and advance lever (2, Fig. II-2).
4. Metering mechanism will not stop after position 20. Dial rotates constantly.	Spring (23, Fig. II-2) unhooked or broken.	Rehook or replace.
	Gears (32 & 33, Fig. II-2) out of synchronization.	Reposition (para. E.).
5. Dial (11, Fig. II-2) does not rotate at exposure start.	Spring (25, Fig. II-2) unhooked or broken.	Rehook or replace.
6. Dial free-wheels at "9" instead of after "20"; numbers not in synchronization with film.	Dial in wrong position in relation to cam.	Rotate dial 180°.
7. Film advance lever (2, Fig. II-2) fails to return.	Spring (10, Fig. II-2) unhooked or broken.	Rehook or replace.
8. Film advance lever does not advance film.	Spring (22A, Fig. II-2) broken.	Replace.
	Pawl on bearing plate assembly (22, Fig. II-2) broken.	Replace bearing plate assembly.
9. Film advance lever binds before completing full swing.	Top plate (13, Fig. II-2) out of adjustment.	Readjust.
10. Lock lever (29, Fig. II-2) does not catch when released from locked position.	Spring on lock lever assembly broken.	Replace lock lever assembly.
11. Film scratch.	Film flattener rollers on frame assembly (2, Fig. II-1) not turning freely.	Lubricate (para. G.).
	Plush lining on tension spring of carriage assembly (49, Fig. II-2) damaged.	Replace carriage assembly.

TABLE II-1 (CONT.)

TROUBLE	CAUSE	REMEDY
12. Film winds through without stopping on numbers.	Spring (30, Fig. II-2) unhooked or broken.	Rehook or replace.
13. Pictures do not start at No. 1 on film.	Spring (25, Fig. II-2) unhooked or broken.	Rehook or replace.
14. Negatives have fogged streaks caused by light leaks.	Screw (14, Fig. II-2) missing.	Replace.
	Light seal (s) (8, Fig. II-1) damaged.	Replace.
15. Not full number of pictures per roll or in wrong position on roll.	Lock lever assembly (29, Fig. II-2) bent or damaged.	Replace.
	Improper threading.	Refer to Instructions Manual.
16. Winding key turns freely in either direction. (This condition will be noted by lack of ratchet sound when lever is advanced.)	Spring (19, Fig. II-2) unhooked or broken.	Rehook or replace.
17. Back cover does not fit correctly - may or may not close and latch.	Top or bottom plate (13 or 44, Fig. II-2) may be out of alignment with carriage.	Realign plate.

F. LUBRICANTS, CLEANING SOLVENTS AND ADHESIVES

Refer to Table I, Section I; the areas specified and references listed for cleaning and lubrication are the same for all roll holders.

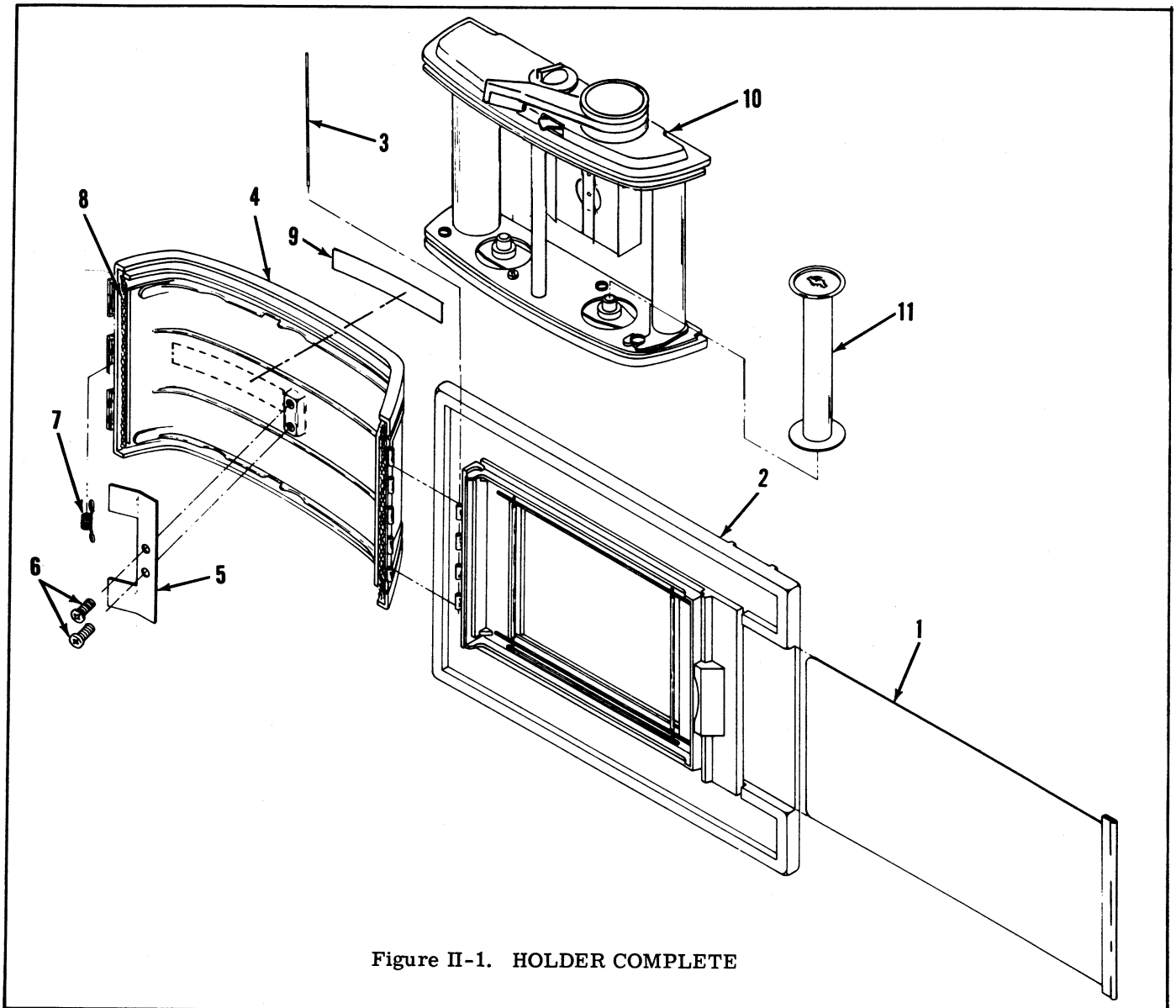

Figure II-1. HOLDER COMPLETE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODELS 43116G4	 43116G7
II-1-	43116G4	Holder Complete (20 Exposure "23") Cat. #1293. .	ref	x	
	43116G7	Holder Complete (20 Exposure "45") Cat. #1297. .	ref		x
-1	30649G3	. Slide Complete Cat. #1432	1	x	
	30649G5	. Slide Complete Cat. #1418	1		x
-2	43125G4	. Frame Assembly	1	x	
	43125G8	. Frame Assembly	1		x
-3	30172-30	. Pin, Straight	1	x	x
-4	43118G1	. Cover Assembly	1	x	x
-5	31791	. . Spring, Film Pressure	1		
		(ATTACHING PARTS)			
-6	30921-28L	. . Screw.	2		
		---*---			
-7	33813	. . Spring, Latch	1		
-8	31787P2	. . Seal, Latch.	2		
-9	43114P4	. Nameplate.	1	x	x
-10	43115G1	. Carriage Complete	1	x	x
-11	31835	. . Spool	1		

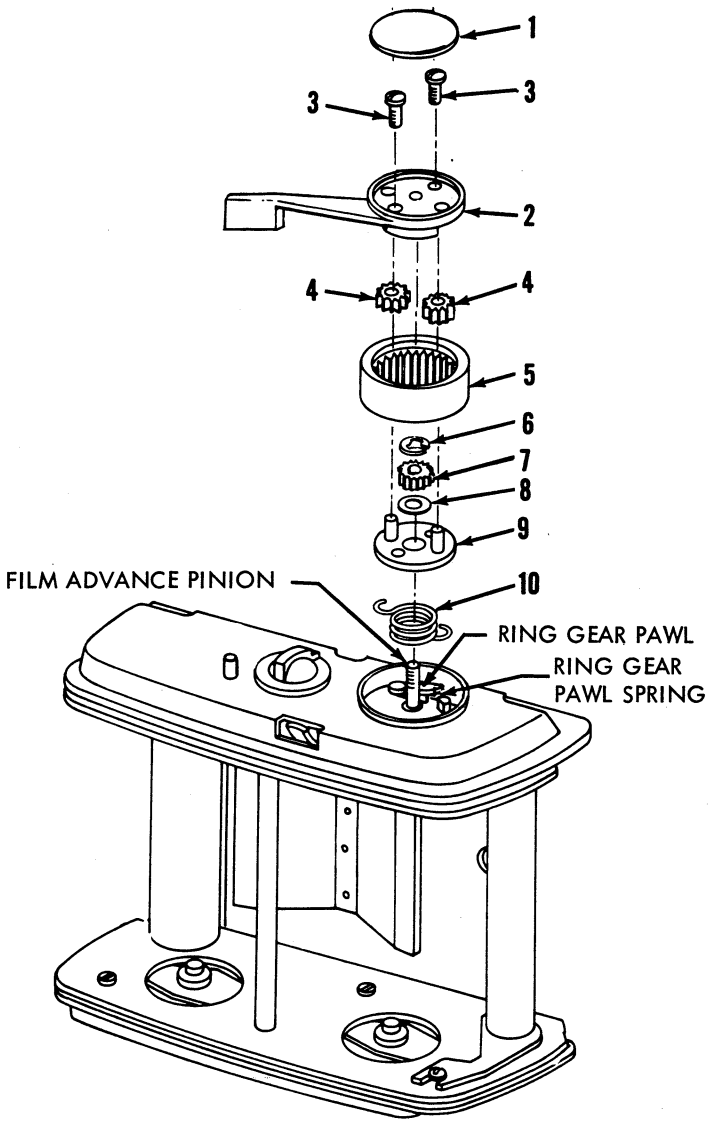

Figure II-2. CARRIAGE COMPLETE, 1ST STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY
II-2-	43115G1	Carriage Complete, (20 Exposure)	1
-1	43109	. Insert	1
-2	43108	. Lever	1
		(ATTACHING PARTS)	
-3	111-4-5L	. Screw, Mach. No. 4 x 5/16.	2
		---*---	
-4	39611P1	. Pinion, Planet	2
-5	39610P2	. Gear, Ring	1
-6	251-5-1	. Ring, Retaining	1
-7	43100P1	. Pinion, Sun	1
-8	30473-72	. Washer, Flat 0.203 x 0.130 x 0.005	AR
-9	39614G2	. Carrier Assembly.	1
-10	39608P1	. Spring	1

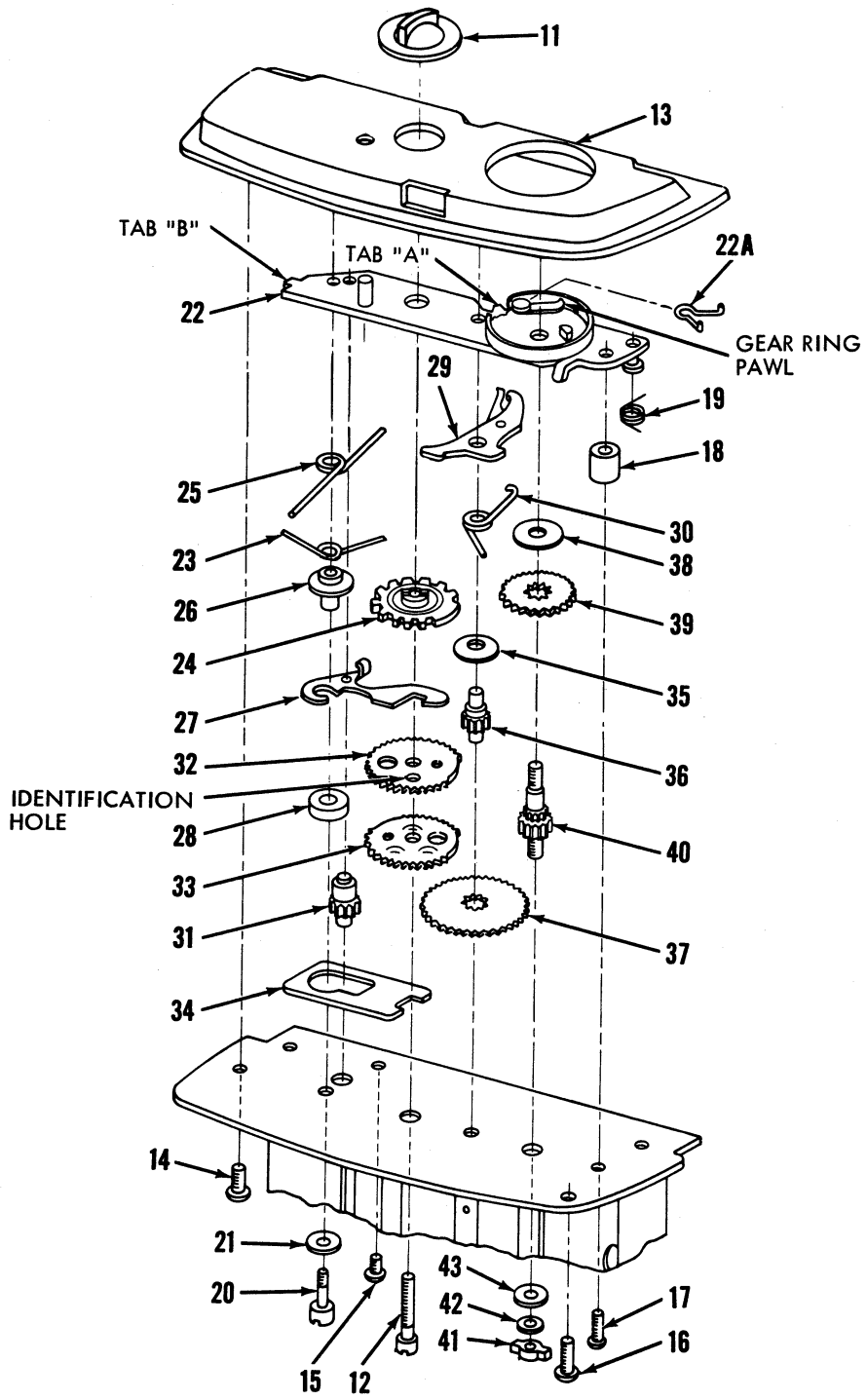

Figure II-2. CARRIAGE COMPLETE, 2ND STAGE

220 ROLL HOLDER, RH 20
MODEL II

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODEL 43115G1
II-2-11	40714P2	. Dial	1	x
		(ATTACHING PARTS)		
-12	31834P5	. Screw, Special - Left Hand Thrd.	1	x
		---*---		
-13	43124P1	. Plate, Top	1	x
		(ATTACHING PARTS)		
-14	33921-13L	. Screw 0.112 x 0.250 Pan Hd..	1	x
-15	33921-1L	. Screw 0.099 x 0.170 Pan Hd..	1	x
-16	137-4-6L	. Screw No. 4 x 0.312 Pan Hd..	1	x
		---*---		
-17	43105	. Screw, Special	1	x
-18	31809	. Spacer	1	x
-19	39605	. Spring	1	x
-20	31826	. Bearing	1	x
-21	41846-1	. Washer 0.312 x 0.093 x 0.010	1	x
-22	43123G1	. Plate Assembly	1	x
-22A	39620	. . Spring	1	x
-23	43103	. Spring	1	x
-24	31820P4	. Cam	1	x
-25	31825	. Spring	1	x
-26	40703	. Bearing	1	x
-27	31823P2	. Lever	1	x
-28	40702	. Spacer	1	x
-29	31817G1	. Lever Assembly	1	x
-30	31816	. Spring	1	x
-31	40705P1	. Pinion	1	x
-32	40706P1	. Gear	1	x
-33	40707P1	. Gear	1	x
-34	40715	. Support	1	x
-35	38500-14A	. Washer 0.312 x 0.130 x 0.005	1	x
-36	40704P1	. Pinion	1	x
-37	31815P2	. Gear	1	x
-38	40627-15	. Washer 0.500 x 0.160 x 0.010	1	x
-39	31813P1	. Ratchet	1	x
-40	43101P1	. Pinion	1	x
-41	31811P1	. Key	1	x
-42	40627-16	. Washer 0.180 x 0.101 x 0.010	1	x
-43	30473-41	. Washer 0.312 x 0.130 x 0.010	1	x

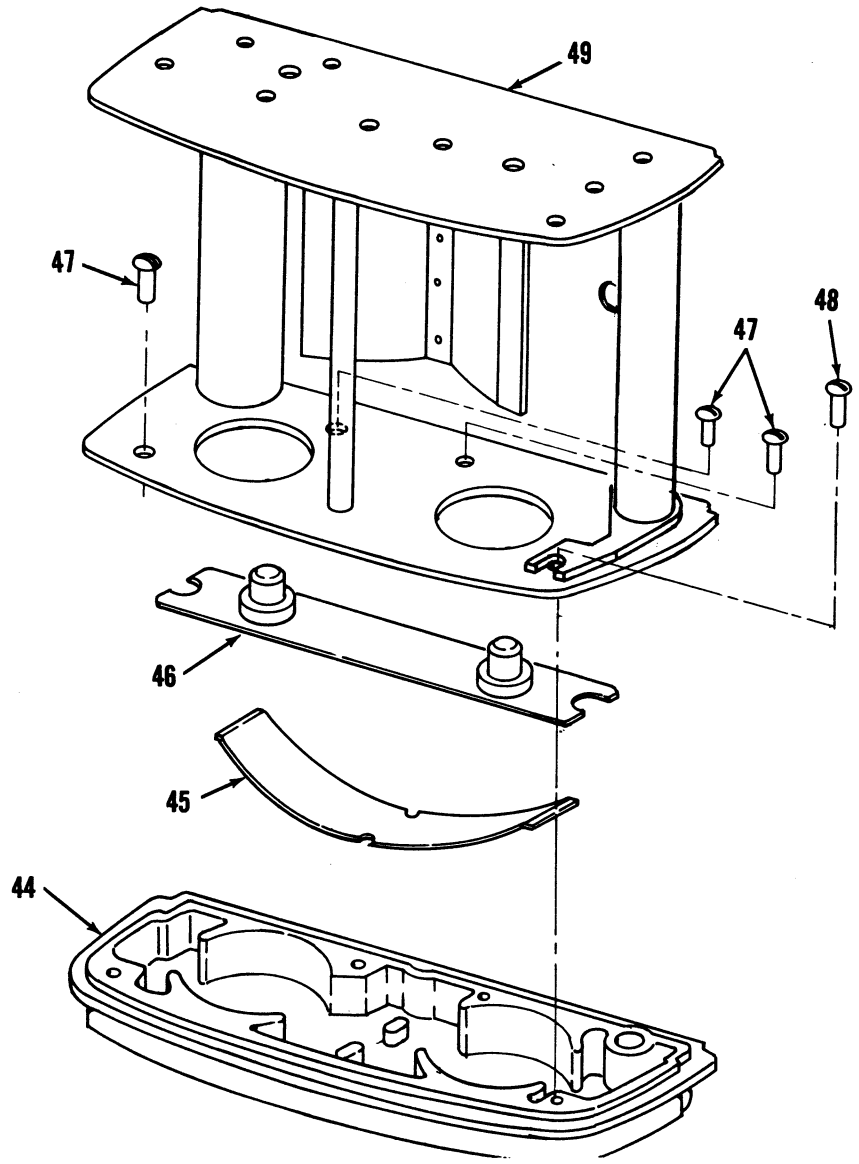

Figure II-2. CARRIAGE COMPLETE, 3RD STAGE

FIG. & INDEX NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5	QTY	MODEL 43115G1
II-2-44	43122P1	. Plate, Bottom	1	x
-45	43110P1	. Spring	1	x
-46	43112G1	. Plate Assembly, Spool Bearing	1	x
		(ATTACHING PARTS)		
-47	33921-13L	. Screw 0.112 x 0.250 Pan Hd.	3	x
-48	137-4-6L	. Screw No. 4 x 0.312 Pan Hd.	1	x
		---*---		
-49	43120G2	. Carriage Assembly	1	x

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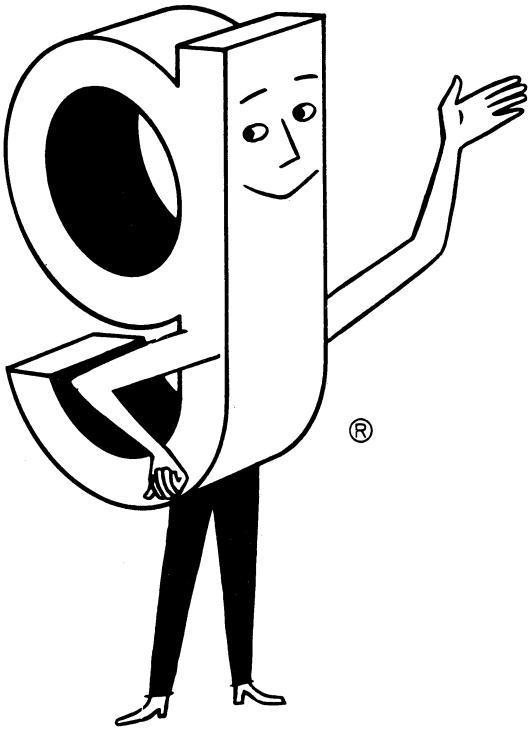

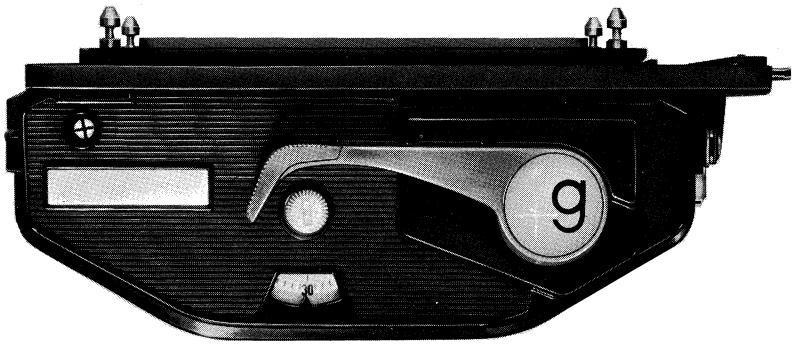

graflex®

SERVICE INSTRUCTIONS AND PARTS LIST

SECTION 91

70mm ROLL HOLDER, RH/50

GRAFLEX, INC., A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION ▪ ROCHESTER, NEW YORK 14603

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LIST OF ILLUSTRATIONS

A. INTRODUCTION

This section of the Service Parts Manual has been prepared as a guide for service and maintenance of the 70mm Roll Holder, RH/50 for 4 x 5 cameras and xl Camera Systems. The singular difference between models is the adapter plate assembly and its attaching parts used for the xl Camera Systems. Obvious procedures are not stated.

B. TROUBLE AND REMEDY TABLE

The purpose of the following table is to list possible repairs and adjustments.

TROUBLE	CAUSE	REMEDY
Dial (7, Fig. 5) does not index.	Index pin of counter gear assembly (18, Fig. 5) broken.	Replace counter gear assembly.
Dial (7, Fig. 5) free wheels in either direction.	Pawl (28, Fig. 5) bent or broken.	Bend to correct shape or replace.
	Screw (27, Fig. 5) loose.	Tighten.
Lever (2, Fig. 5) binds before completing full stroke or does not return.	Spring (22, Fig. 5) loose or broken.	Rehook or replace.
Lever (2, Fig. 5) does not advance film.	Brake (19, Fig. 5) broken.	Replace.
	Spring (13, Fig. 5) weak.	Replace.
	Gear (14, Fig. 5) worn.	Replace.
	Cassette(s) (2, Fig. 4) damaged.	Replace.
Negatives have fogged streaks caused by light leaks.	Screw (5 or 6, Fig. 5) missing.	Replace.
	Light seal(s) at end of cover (7, Fig. 4) damaged.	Replace light seal(s).
Film scratch.	Film rollers (6c, Fig. 4) not turning freely.	Clean (para. C.) and lubricate (para. G.) or replace if damaged.
	Cassette(s) (2, Fig. 4) dirty or damaged.	Clean (para. C.) or replace.
Lower plate assembly (37, Fig. 5) does not latch.	Spring (36, Fig. 5) bent.	Replace or straighten.
	Latch assembly (35, Fig. 5) binding.	Lubricate (para. G.) or replace.
Rear cover (7, Fig. 4) does not latch.	Latch spring of cover unhooked or broken.	Rehook or replace latch spring.

C. CLEANING

To clean the carriage, cover assembly, and film rollers, wipe exterior surfaces with a damp cloth and mild soap. Do not use solvents. Dry thoroughly with a soft, lint-free cloth. When cleaning cassettes, brush the inside and pay particular attention to brushing the plush-lined light seal lips through which the film is fed.

D. DISASSEMBLY

Refer to Figure 4 for disassembly of the Roll Holder Complete. Refer to Figure 5 for disassembly of the Carriage Complete.

NOTE

Winding key (10, Fig. 5) must be turned clockwise for removal.

E. REASSEMBLY - CARRIAGE COMPLETE (Figure 5)

Refer to paragraph G "Lubricants, Adhesives, and Solvents" before starting reassembly procedure.

1. Cassette cushion (38) must be visually centered in carriage assembly within 3/32" of edge of hinge. Cushion must not overlap holes in carriage or hinge edge.

2. Spindles of lower plate assembly (37) must rotate freely.

3. When replacing spring (36) and latch (35), position on plate assembly (37) with one loop of spring around large diameter of latch stud and other loop below latch and around stud of plate assembly as shown in Figure 1.

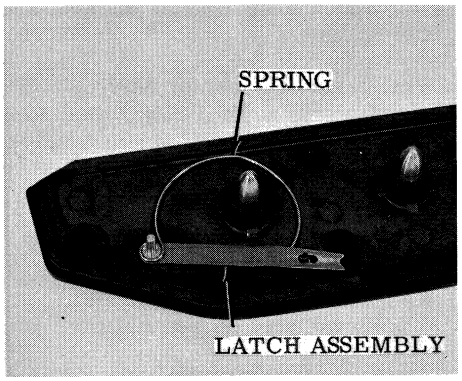


Figure 1. LATCH AND SPRING POSITIONING

4. After replacing bottom cover (34), latch should operate smoothly, without excessive force, and should snap into the locked position when released.

5. Carefully file set screw burrs from drive roller (31) shaft.

6. Assemble idler roller (32) and drive roller (31) to carriage.

7. Secure gear plate assembly (30) to carriage with support (29).

8. Spool spindle (26) must rotate freely.

9. When replacing main gear assembly (24), position with retainer side down.

10. Rounded end of pin (23) seats in hole of gear (24).

11. Assemble spring (22) to hub (21) and engage spring hook in slot of hub.

12. Replace hub (21) with long edges of pads parallel to rear edge of plate assembly (30).

13. Hold hub stationary and rotate gear (24) clockwise until it stops. Hub and gear (24) must remain in this position.

14. Assemble brake (19) to gear assembly (18) and position so brake slot is engaging stud on gear plate assembly as shown in Figure 2.

15. Rotate counter gear assembly (18) to locate index pin within 30° arc as shown in Figure 2. Pin must remain within this arc.

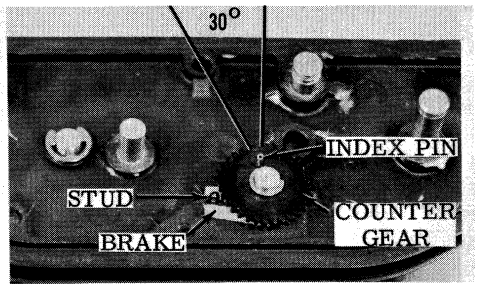


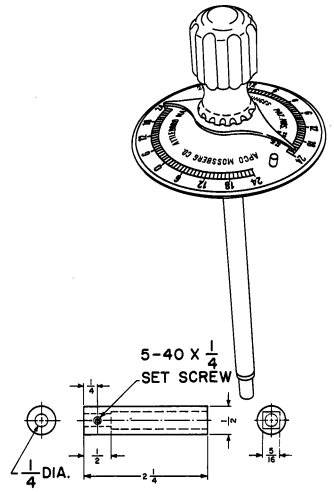
Figure 2. PIN AND BRAKE ALIGNMENT

16. Push spring (13) on gear (14) and insert shaft assembly (12) through gear.

17. Position gear (14) to mesh with gears (16 & 18) while maintaining position of gears (18 & 24) as described in steps 13 and 15. Winding key (10) must be turned counterclockwise for replacement.

18. Hook spring (22) in groove of mounting shaft of gear (16).

19. Using torque gage G17-38000 (Figure 3), available from Graflex Inc., or from Apco Mossberg Co., Attleboro, Mass., check the clutch torque at the winding key. Place the gage on the winding key and rotate main gear assembly (24) counterclockwise. The torque reading must be 8 to 16 inch-ounces.



24 Inches Ounces Torque Screw Driver

Material: Steel

Figure 3. TORQUE GAGE G17-38000

20. When replacing dial (7) do not attempt to turn it clockwise. Dial should be turned only in counterclockwise direction and must rotate with 2 to 5 inch-ounces of torque.

a. Adjust pawl (28) to engage dial at full depth of tooth and to align dial with pointer in cover within one graduation width (cover does not have to be tightened down for alignment check). Dial must not index beyond position 56 (not marked on dial).

b. If necessary, bend indexing pin of gear assembly (18) for positive indexing overtravel.

21. Position cover assembly (4) for best alignment with back edge and both ends of carriage before tightening screws (5 & 6).

22. Turn hub (21) counterclockwise approximately 180°, against spring pressure, until long edges of pads are parallel to rear edge of cover.

23. Place lever on hub so pads engage recess on underside of lever and lever is against contoured stop of cover.

24. Each full stroke of lever must rotate drive roller and winding key. It must index the dial between 3/4 and 7/8 travel of a full stroke.

F. REASSEMBLY - COVER AND FRAME (Figure 4)

Refer to paragraph G "Lubricants, Adhesives, and Solvents" before starting reassembly procedure.

1. Cover assembly (7) must hinge freely and latch securely. Latch must not release when only one catch is operated; it must release when both catches are operated simultaneously.

2. Ends of film roller retainers on frame assembly (6) must return to normal position after replacing film rollers (6c). Do not lift retainer ends more than 1/8 inch from normal position when inserting film rollers.

3. When attaching adapter assembly (5) to frame assembly (6), apply a small bead of sealer (EC-612) to inner edges of recess in adapter assembly. Partially tighten the four screws of the adapter assembly to the frame assembly.

NOTE

Position bevel end of adapter assembly as shown in Figure 4.

Press both assemblies together with pressure applied to the rim of the adapter assembly between the mounting screws. Excess sealant must not flow out beyond the recess of the adapter assembly or beyond the mating surfaces of both assemblies. Tighten the four screws of the adapter assembly. (The adapter assembly must not be bowed after it is secured to the frame assembly.)

G. LUBRICANTS, ADHESIVES, AND SOLVENTS

As a convenience for service and repair of the 70mm Roll Holder, materials have been set up in economic quantities. Materials identified with a Graflex part number can be ordered by part number directly from Graflex Inc.

USED ON	REFERENCE	LUBRICANTS	GRAFLEX PART NO.
Roller - Film (roller grooves)	(6c, Fig. 4)	Molykote Type Z	39484P2
Dial (bearing surfaces)	(7, Fig. 5)	FS-1290	39479P4
Shaft Assembly (bearing surfaces)	(12, Fig. 5)		
Gear - Take-up (outside hub diameter)	(14, Fig. 5)		
NOTE Interfaces between brake (19, Fig. 5) and gear (18, Fig. 5) must be free of lubricant.			
Gear - Intermediate (bearing surfaces)	(16, Fig. 5)		
Hub (bearing surfaces)	(21, Fig. 5)		
Pin - Ratchet (bearing surfaces)	(23, Fig. 5)		
Gear Assembly - Main (bearing surfaces and teeth)	(24, Fig. 5)		
Plate Assembly - Gear (bearing surfaces)	(30, Fig. 5)		
Roller Assembly - Film (bearing surfaces)	(31, Fig. 5)		
Roller Assembly - Film (bearing surfaces)	(32, Fig. 5)		
Latch Assembly (sliding contact surfaces)	(35, Fig. 5)		
Plate Assembly - Lower (bearing surfaces)	(37, Fig. 5)		

USED ON	REFERENCE	ADHESIVES OR SEALANTS	GRAFLEX PART NO.
Adapter Assembly to Frame Assembly	(5, Fig. 4) to (6, Fig. 4)	EC-612	39491P1
Windows, pawl, and cushion to cover assembly	(4, Fig. 5)	EC-847	39491P2
Covering to frame assembly	(6a & 6b, Fig. 4) to (6, Fig. 4)		
Light seals to cover assembly	(7, Fig. 4)	EC-880	39491P3
Screw (head and slot)	(27, Fig. 5)	Glyptal ZV-903 (purple)	39490P1
Support - Carriage Base (approximately 3/16 of threads)	(29, Fig. 5)	Loctite Sealant "E"	39491P8
Screw - Machine	(3, Fig. 5)		

Shaft Assembly (threads)	(12, Fig. 5)		
USE	REFERENCE	SOLVENTS	GRAFLEX PART NO.
Removing old cement		Toluol	Local Purchase
Activate adhesive for medallion	(1, Fig. 5)		

H. MASK SELECTION CHART

MASK CATALOG NUMBER	2-1/4 x 2-3/4 PICTURE SIZE
	Focal length of lenses in millimeters
9105-4	70-84
9105-3	86-90
9105-2	92-101
9105-9	103-125
9105-10	127-138
9105-11	140-162
9105-8	164-191
9105-7	192-227
9105-6	229-267
9105-5	268-305
3060 W. A. Adapter	47-69

PARTS LIST

The Group Assembly Parts Lists are listed in disassembly order. Each list divides the components into major assemblies, their subassemblies and parts. By the use of indented columns, the relationship of the assemblies to the subassemblies and parts is obtained.

The column titled "Figure and Index No." contains the index number in disassembly order of the items illustrated. Do NOT use the figure or index number in correspondence - specify the catalog or part number and name.

The column titled "Nomenclature" (including numbered columns) lists item nomenclature on the Graflex drawing. The assembly in the column marked "3" will be a component of the first assembly which preceded it in the column marked "2", etc. The code "NP" will indicate that this part is "not procurable" and that the "next higher assembly" (NHA) should be ordered. The code "AR" is used for bulk items when an indefinite amount may or may not be used "as required." The code "LP" is used when an item may be "locally purchased."

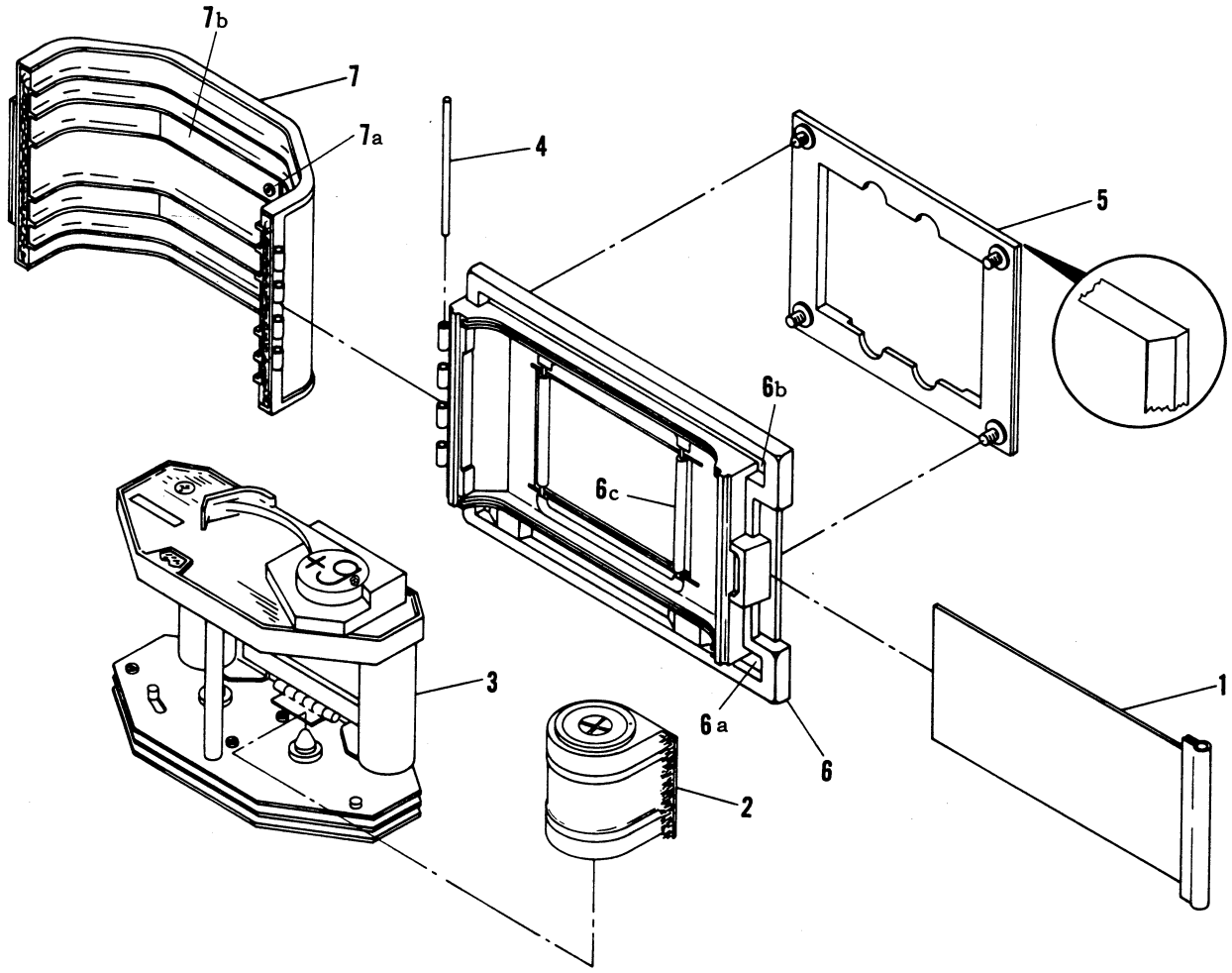


Figure 4. ROLL HOLDER COMPLETE

Figure and Index No.	Part Number	1 2 3 4 5 Nomenclature	Qty.
4-	40330G1	Holder Complete - Roll Film, RH/50, Cat. No. 1240 (4 x 5 camera).	Ref.
	40330G2	Holder Complete - Roll Film, RH/50, Cat. No. 7351 (xl Camera Systems)	Ref.
-1	30649G7	. Slide Complete, Cat. No. 1440	1
-2	33295P1	. Magazine Complete (cassette) Cat. No. 7010	2
-3	40344G1	. Carriage Complete (Figure 5)	1
-4	30172-30	. Pin - Straight (hinge)	1
-5	40399G1	. Plate Assembly - Adapter, (xl Camera Systems)	1
	251-8L	. . Ring - Retaining	4
	40390	. . Screw - Machine (special)	4
-6	40331G1	. Frame Assembly	1
-6a	40401P1	. . Covering, Lower	1
-6b	40401P2	. . Covering, Upper	1
-6c	40334P1	. . Roller - Film	2
-7	40340G1	. Cover Assembly - Rear	1
-7a	33921-8L	. . Screw - Self Threading, No. 3 x 1/4 round hd	2
-7b	40342	. . Spring - Carriage	2
	33813	. . Spring - Latch	1
	40340P11	. . Seal - Light (4 ply black yarn)	LP

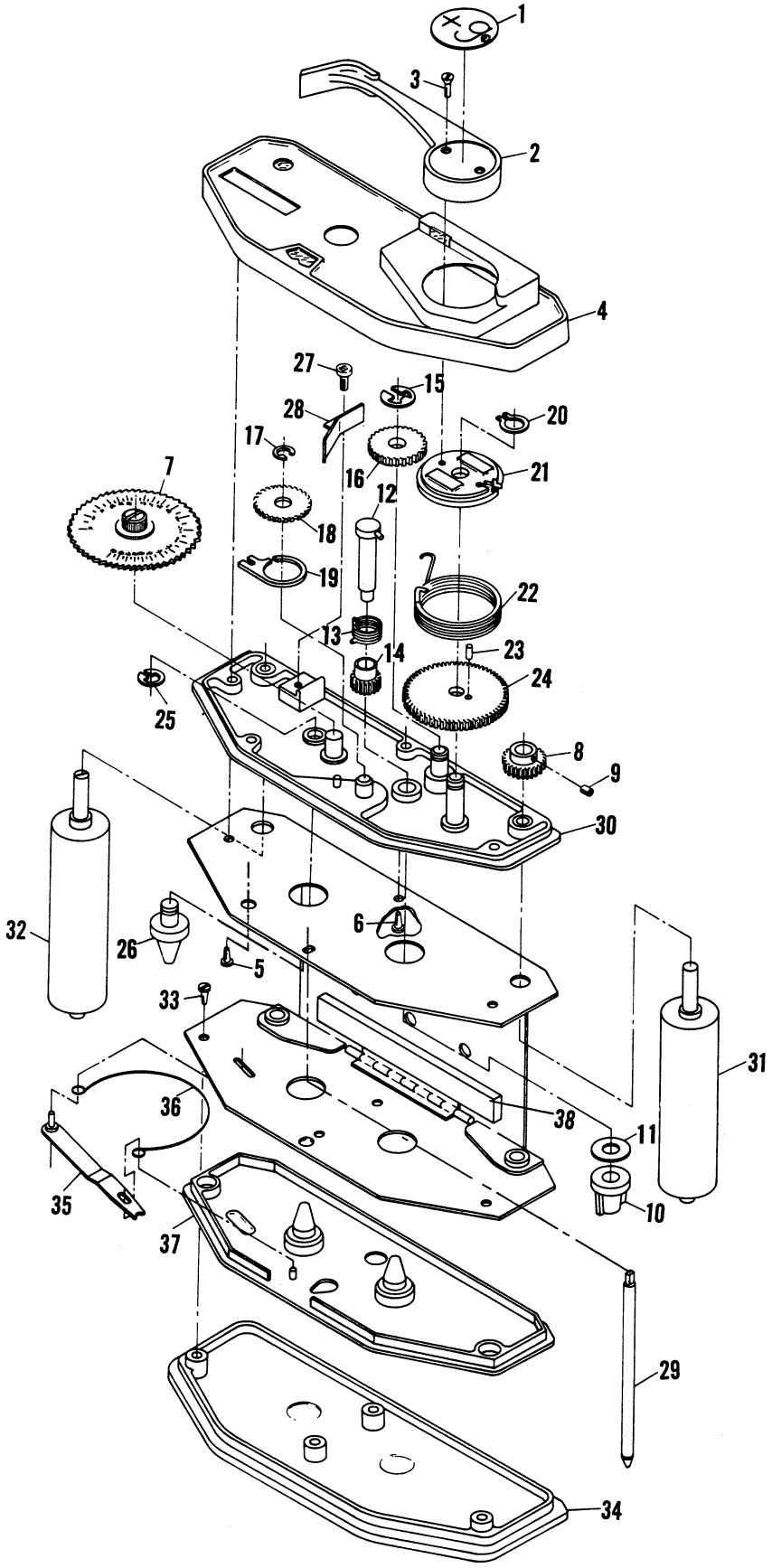


Figure 5. CARRIAGE COMPLETE

Figure and Index No.	Part Number	1 2 3 4 5 Nomenclature	Qty.	
5-	40344G1	Carriage Complete, Cat. No. 1206	Ref.	
-1	39626P1	. Medallion	1	
-2	40397P1	. Lever - Film Advance	1	
	Attaching Part			
-3	100-4R6L	. Screw - Machine, No. 4-40 x 3/8 flat hd.	2	
	---***---			
-4	40393G1	. Cover Assembly - Top.	1	
	31888P2	. . Panel - Notation	1	
	40343	. . Cushion - Lever	1	
	40395	. . Window	1	
		. . Cover - Top	NP	NHA
	Attaching Parts			
-5	40921-1L	. Screw - Self Threading, No. 4 x 7/16 pan hd	1	
-6	33921-16L	. Screw - Self Threading, No. 4 x 1/2 pan hd.	3	
	---***---			
-7	40372G1	. Dial Assembly - Exposure Counter	1	
-8	40392P1	. Gear - Drive Roller	1	
	Attaching Part			
-9	171F4-2	. Screw - Set, No. 4-40 x 1/8 cone point.	2	
	---***---			
	40364G1	. Plate Complete - Gear.	Ref.	
-10	32673P1	. . Key - Winding.	1	
-11	30473-41	. . Washer - Flat, 0.312 x 0.128 x 0.010.	1	
-12	40377G1	. . Shaft Assembly - Film Take-up	1	
-13	40386	. . Spring - Clutch	1	
-14	40387P1	. . Gear - Take-up.	1	
-15	251-1	. . Ring - Retaining	1	
-16	40379P1	. . Gear - Intermediate.	1	
-17	253-5	. . Ring - Retaining	1	
-18	40375G1	. . Gear Assembly - Counter	1	
-19	40388	. . Brake - Gear Train	1	
-20	250C4	. . Ring - Retaining	1	
-21	40384P1	. . Hub	1	
-22	40383P1	. . Spring - Film Advance Lever	1	
-23	40382	. . Pin - Ratchet	1	
-24	40363G1	. . Gear Assembly - Main	1	
-25	251-10	. . Ring - Retaining	1	
-26	40354	. . Spindle - Spool	1	
-27	121-6R4	. . Screw - Thread Forming, No. 6 x 1/4 pan hd.	1	
-28	40389P1	. . Pawl - Exposure Counter Dial	1	
-29	40391P1	. . Support - Carriage Base.	1	
-30	40365G1	. . Plate Assembly - Gear.	1	
-31	40360G1	. Roller Assembly - Film, Drive.	1	
-32	40360G2	. Roller Assembly - Film, Idler	1	
	40345G2	. Carriage Assembly, Second	Ref.	
-33	33921-13L	. . Screw - Self Threading, No. 4 x 1/4 pan hd	4	
-34	40358P1	. . Cover - Bottom.	1	
-35	40355G1	. . Latch Assembly	1	
-36	40359	. . Spring - Latch	1	
-37	40352G1	. . Plate Assembly - Lower.	1	
	251-10	. . . Ring - Retaining	2	
	40354	. . . Spindle - Spool	2	
	40345G1	. . Carriage Assembly, First	1	
-38	39474P4	. . . Dampener - Sound (cassette cushion).	1	

SECTION 77

GRAFMATIC® 45

SERVICE INSTRUCTIONS
and
PARTS CATALOG

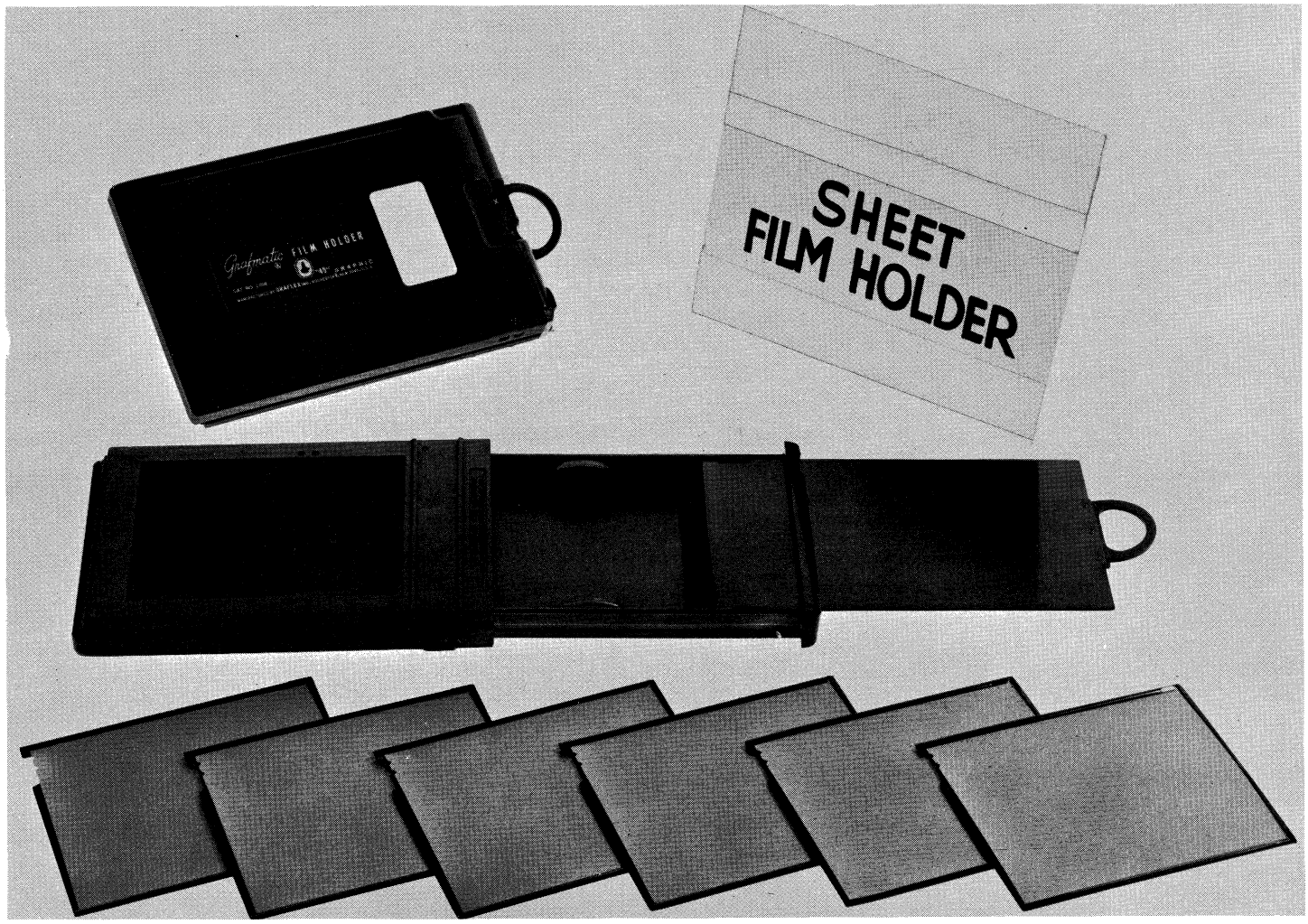


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TABLE OF CONTENTS

PARTS LIST

1. INTRODUCTION

The 4x5 Graphic Grafmatic Film Holder (for Graflok Back) and the 4x5 Graflex Grafmatic Film Holder (for Graflex Back) is an automatic magazine holding six individual sheets of cut film. Besides indicating the exposure number, it has an indicator to tell whether the film is in the exposed position or covered. It also has a device numbering each negative as it is exposed.

The 4x5 Graphic Grafmatic holder is not recommended for use with Graphic Backs, since Graphic Backs do not have the facilities for locking the Grafmatic in place -- but if used, care must be taken to avoid accidental removal of the holder during operation. When the Grafmatic holder is used in a Graflok Back, slide it under the focusing panel and be sure to lock it in place with the slide locks.

2. OPERATION

Two movements are required - - PUSH and PULL. When pulling the slide or film compartment, pull straight outward -- not backward -- to avoid leverage pressure against the focusing panel or slide locks with possible danger of light leak. First check to see that the exposure counter dial is turned (use the edge of your thumb) so that the number "1" appears and that the drawer lock disc is turned to allow operation of the dark slide.

Pull the slide all the way out and push it all the way back. The first film septum will spring upward and be locked in the exposed position and the red dot at the back of the holder will be uncovered indicating that a film is in position ready for exposure.

After exposure the first film must be moved out of the way. To do this, press down with your thumb on the chrome latch holding it against the slide handle and PULL the entire film compartment all of the way out. Release the latch and PUSH the entire compartment in with the handle. When it is all the way in, the exposure counter dial will move to No. 2 and the red dot will be covered indicating that the film is covered and that the holder can be removed from the camera.

The same sequence is followed for all six exposures, after which an "X" will show on the exposure counter dial and both the slide and drawer will be locked in the compartment indicating the six exposures have been made.

NOTE: The Grafmatic holder must be in the camera when the septums are being shifted. The film will be fogged if the film compartment is opened when the holder is not in the camera. To prevent accidental opening of the drawer (on early model) be sure the counter dial is set at a numbered position. To release the slide for recycling or loading turn the dial to No. 1.

To load or unload the Grafmatic film holder set the indicator dial on a number, press the chrome latch toward the handle and pull the film compartment out. Hold this compartment in this extended position and PUSH the slide handle in until it releases the chrome latch, then PULL the slide out. Film septums have springs under them and will pop up. When loading the septums, keep the film notch over the notch at the open edge of the septum.

Before putting the septum back into the compartment, be sure that the counter slide, by the felt strip, has been pulled back out of the way, into the end of the film compartment.

CAUTION: When the holder is open for loading, note that slight pressure on the button on the underside of the film compartment will release the automatic exposure counter slide. If the holder is laid on a flat bench, no difficulty will be encountered; otherwise, it will be necessary to make sure that this slide does not extend into the septum chamber before attempting to insert the septums -- failure to do so may result in jammed and bent septums.

When loading septums in the film compartment use the thumb and finger, holding them to act as a channel, guiding the septums down into place. All six septums must be in the compartment in order to operate the counting mechanism.

3. INSPECTION and TROUBLES

Many troubles encountered by the repairman will be very obvious, while others will not be too apparent. The following table of potential troubles, causes and remedies is supplied so that difficulties may be promptly recognized and proper steps taken to overcome them. Before disassembly check for loose or missing screws and sliding surfaces that are binding because of lack of lubrication.

TROUBLE	CAUSE	REMEDY
Slide pulls out.	Slide stop and spring missing.	Replace with new stop and spring.
Drawer binds.	Lack of lubrication on edges.	Apply paraffin.
Drawer pulls out.	Missing drawer plate stop screws - screws work loose through vibration.	Replace parts - seal screws in place with Glyptol or lacquer.
Septums bent.	Improper loading or handling of septums.	Replace septums.
Light leak.	Cutoff assemblies damaged in disassembly.	Replace damaged cutoffs.
Counter dial does not work.	Less than six septums.	Add missing septums.
	Magnets have lost magnetism.	Replace magnet assembly.
	Missing magnet gear assembly.	Replace.
	Missing counter dial gear.	Replace.
	Missing septum stop.	Replace.
	Missing counter slide.	Replace.
	Broken counter slide.	Replace.
Counter dial numbers not in synchronization with film exposure dial numbers.	Magnet gear assembly or counter-dial in wrong position.	Realign counter mechanism.
Counter dial does not advance when septum is changed - jumps back and forth.	Detent spring broken or missing.	Replace spring.
	Detent missing.	Replace detent.
	Detent spring unhooked.	Hook spring.
	Slide stop spring weak, broken or missing.	Replace spring.
Red dot does not appear when slide is withdrawn.	Broken counter slide spring.	Replace spring.
	Septum does not move forward.	Replace any bent or damaged septums.
Red dot does not disappear when drawer is operated.	Missing septum stop. Less than six septums.	Replace with new stop. Add missing septums.
Drawer latch does not operate but latch lever does.	Drawer latch spring broken.	Replace spring.
	Drawer latch spring unhooked.	Rehook spring.
Neither drawer latch lever nor drawer latch operates.	Drawer latch spring broken or unhooked and detent spring broken or unhooked.	Check and replace springs if necessary.
Drawer does not lock after six exposures.	Lock lever spring broken or unhooked.	Check and replace springs if necessary.

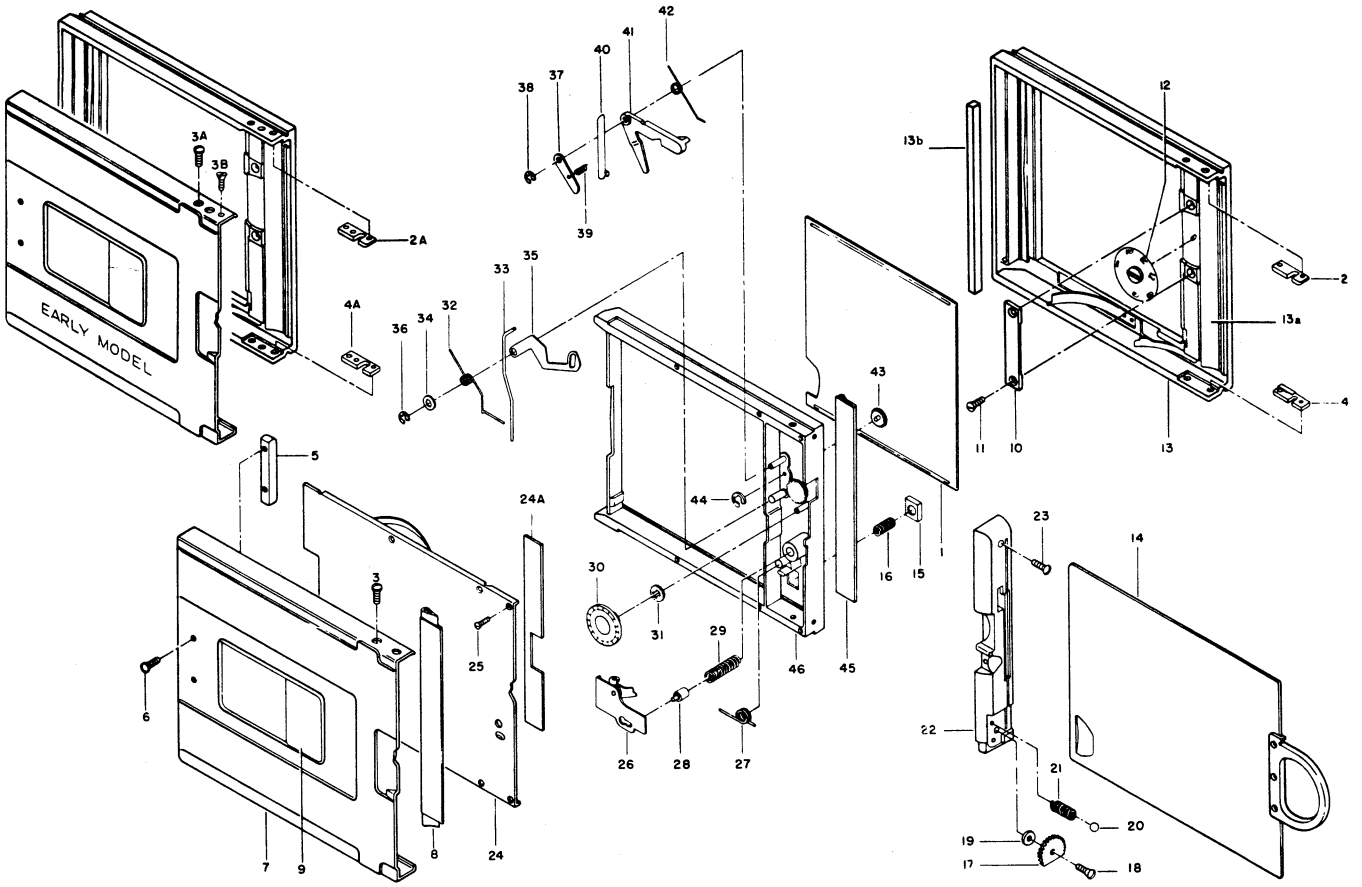


Figure 1. Grafmatic 45 (Exploded View)

4. DISASSEMBLY

a. Remove film septums (1).

b. Remove two drawer stop plates (2 and 4) by removing screws (3). Remove drawer from the Grafmatic by pulling straight out.

CAUTION: The slide (14) must be all the way in when drawer is removed or the cutoff assembly(13a) will be damaged.

c. Remove septum stop (5) by removing two screws (6).

d. Slide the cover (7) from the case assembly (13).

CAUTION: Insert a sheet of heavy paper or film holder slide between the cover and the case assembly before removing the cover to prevent damage to the cutoff assembly (8).

e. If necessary, remove the cutoff assembly (8) and data panel (9) from cover (7).

f. Remove dial assembly retainer (10) by removing two screws (11) and remove film dial assembly (12).

g. If necessary, remove cutoff assembly (13a) and felt seal (13b) from case assembly (13).

h. Remove dark slide (14) by using a stop depressing plate (make plate from brass shim stock 0.006 in. thick by 1-1/2 inch by 4 inches) inserted to the end of the dark slide, between the half withdrawn dark slide and the drawer. Pull the dark slide from the drawer and remove the slide stop (15) and spring (16).

i. Remove drawer locking disc (17) by removing one screw (18). Remove washer (19), ball (20) and locking disc spring (21).

j. Remove drawer plate (22) by removing one screw (23).

k. Remove cover assembly (24) by removing six screws (25). If necessary, remove felt seal (24a).

l. Remove counter slide assembly (26), counter slide spring (27), slide stop (28) and slide stop spring (29).

m. Remove counter dial (30) and gear (31).

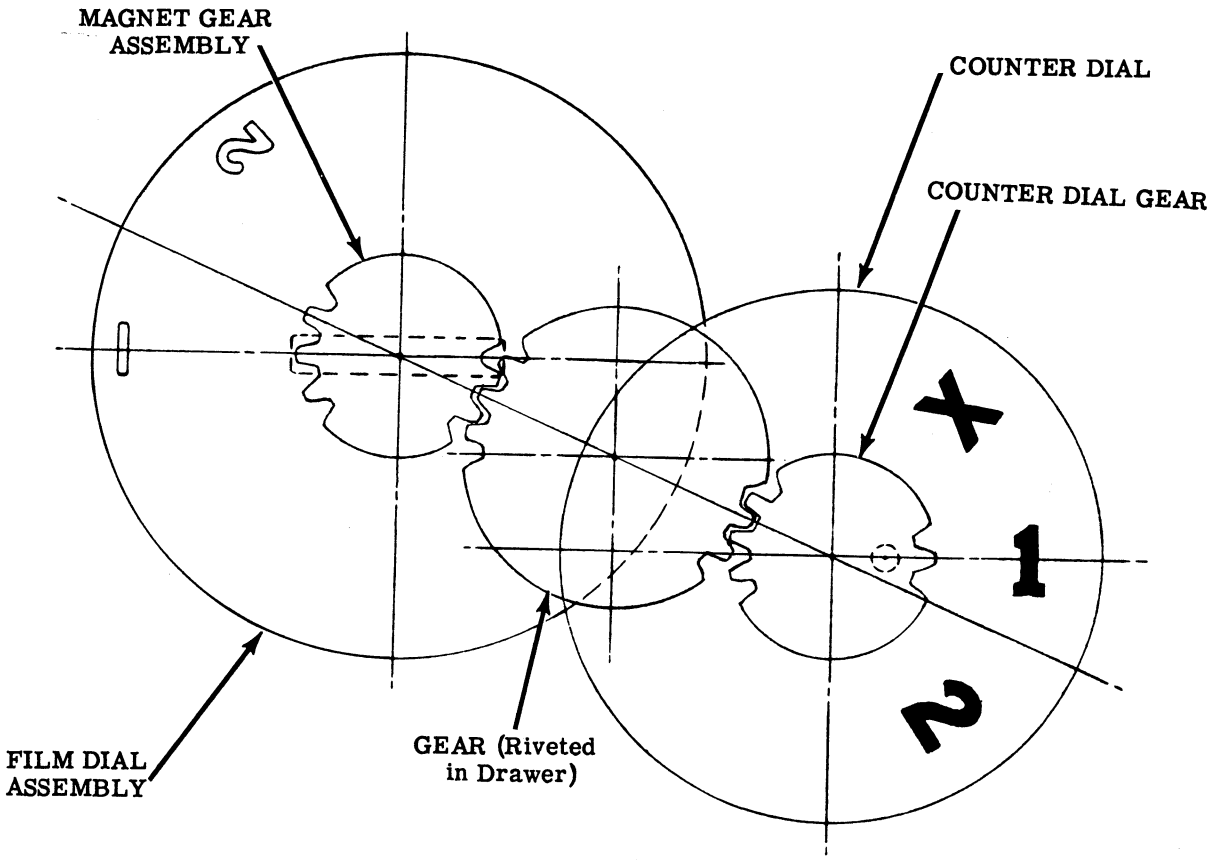
n. Unhook spring (32) from notch on lock bar (33). Remove washer (34), lock lever spring (32), lock bar (33) and lock lever (35) secured by retaining ring (36).

o. Unhook detent spring (39) from the latch lever (41) and remove detent (37) by removing retaining ring (38). Remove detent spring (39) from detent, unhook latch spring (42) from notch in latch (40) and remove latch (40), latch lever (41) and latch spring (42).

p. Remove magnet gear assembly (43) by removing retaining ring (44). If necessary, remove cutoff assembly (45) from drawer assembly (46).

5. CLEANING

Reassembly drawer after thoroughly cleaning; use trichlorethylene to remove all old lubricants, toluol and acetone to remove old EC-784 cement.



Top view of gear train and dial assembly in correct position. With counter dial located with number "1" in position shown, magnet gear assembly with slot parallel to long axis of holder and magnet with north pole toward the septum compartment of drawer. Film dial assembly should be installed with number "1" in position shown.

6. REASSEMBLY

a. Reassemble cutoff assembly (45) to drawer assembly (46) using 1/2 inch tape.

b. Apply small amount of grease, MIL-G-3278, to shaft of magnet gear assembly (43) and assemble to the drawer so that the magnet gear assembly is perpendicular to adjacent cross-piece of drawer, when magnet gear meshes with gear riveted to drawer. Secure in place with retaining ring (44).

NOTE: It is very important that the magnet gear be assembled correctly to be in synchronization with the counter dial. Check magnet polarity with a compass whenever the magnet gear assembly is removed from the drawer or when a replacement magnet gear assembly is being installed.

c. Apply small amount of grease, MIL-G-3278, to brass studs riveted in drawer and assemble latch spring (42), latch lever (41) and latch (40) hooking spring under latch lever and into notch of latch. Hook detent

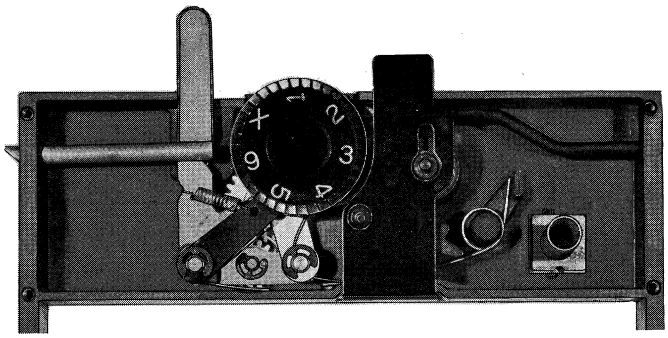


Figure 2. Counter Mechanism (Current Model)

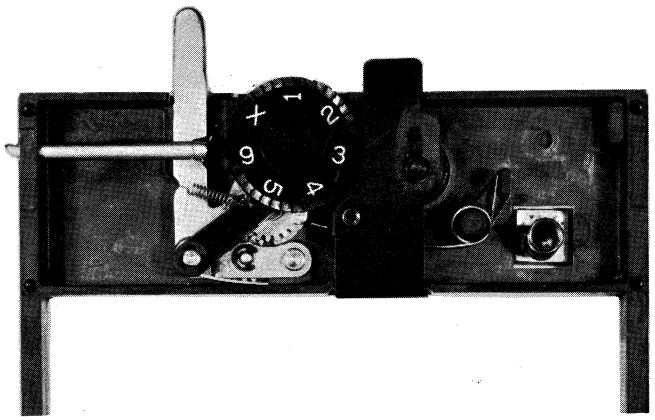


Figure 2A. Counter Mechanism (Early Model)

spring (39) to detent (37) and secure in place with retaining ring (38). Hook square end of detent spring in notch on side of latch lever (41).

d. Assemble lock lever (35), lock bar (33), lock lever spring (32), washer (34) and secure with retaining ring (36). Hook lock lever spring (32) under lock lever (35) and into notch on end of lock bar (33).

e. Apply Glyptol to counter dial (30) and assemble gear (31), making sure identification mark is on the outside and in line with the number "1" on counter dial.

NOTE: Assemble counter dial so that the number "1" is in location and the gear on the end of the counter dial meshes with the gear riveted in the drawer. See figure on page 4.

f. Assemble the slide stop spring (29) and slide stop (28).

g. Apply a small amount of grease, MIL-G-3278, to hole in lever of counter slide assembly (26). Assemble the counter slide spring (27) on boss on drawer and insert long end of spring through hole of lever of counter slide assembly. Assemble to drawer, keeping the lever to the side and under flange of the counter dial (30), so that the end of the lever engages the counter dial notches.

h. Recement felt seal (24a) to drawer cover assembly (24) using EC-784.

i. Insert a drop of Glyptol, lacquer or shellac into each of the six holes in the drawer and assemble the cover assembly (24) using six screws (25).

j. Assemble the drawer plate (22) and secure with one screw (23).

k. Assemble locking disc spring (21), ball (20) to drawer plate and assemble washer (19), locking disc (17) and secure with screw (18).

l. Lubricate side edges of dark slide (14) with paraffin. Insert slide until it just covers cutoff assembly (45). Assemble stop spring (16) to slide stop (15) and insert into position in the drawer so that the punched lip is facing the slide. Depress stop into hole in drawer until it clears the dark slide. Push dark slide (14) inward until stop drops into notch of slide. Operate dark slide several times to insure correct assembly.

m. If felt seal (13b) has been removed, recement with EC-784 to case assembly (13) and assemble cutoff assembly (13a) using 1/2 inch tape.

n. Assemble film dial assembly (12) and dial retainer (10) to case assembly (13) and secure in place using two screws (11).

o. If necessary, recement the data panel (9), using EC-784, to cover (7) and assemble cutoff assembly (8) using 1/2 inch tape. Assemble septum stop (5) using two screws (6).

p. Assemble cover (7) and case assembly (13). Slide the dark slide all the way into the drawer and insert the drawer complete into the assembled case and cover.

q. Turn magazine on edge, with front of magazine away from the repairman, pull the drawer out half way, assemble drawer plate stops (4 and 2) and apply a drop of Glyptol, lacquer or shellac into each screw hole and secure in place with screws (3).

NOTE: After assembly wipe off any excess Glyptol, lacquer or shellac from edge of drawer.

r. Insert septums (1) and check correct synchronization between counter and film exposure dial, correct operation of drawer latch, drawer latch lever, and proper cycling of septums and correct operation of counter mechanism. Check the drawer lock to see if the drawer locks in place after the sixth septum has been rotated and the "X" on counter dial will be in position.

CAUTION: To prevent damage to septums when Grafmatic is loaded make sure that the counter slide is pushed back out of the way, into the end of the film compartment.

LUBRICANTS, CLEANING SOLVENTS, ADHESIVES

Materials are specified for general reference by U.S. Government Specifications. If the recommended material cannot be located, local suppliers can advise a substitute that meets a specification number.

Compound	U.S. Government Specification	Manufacturer	Use or Application
LUBRICANTS			
Neolube	Not assigned	Huron Industries Huron, Michigan	Drawer dark slide channels Counter slide Drawer stop plates Holes in drawer lock disc for steel ball
Dow No. 44 light consistency silicone grease or Texaco Unitemp	---------- MIL-G-3278	Dow Corning Corp. Midland, Michigan Texas, Co.	Hole in drawer for latch Hole in drawer for bar Hole in lever of counter slide assembly Brass studs of drawer Shaft of magnet gear assy.
Paraffin	VV-P-121a	Socony Vacuum New York, N. Y.	Edges of drawer Edges of dark slide
SOLVENTS			
Trichlorethylene (2nd choice - Carbon Tetrachloride)	AN-T-37a	Eastman Kodak Co. Rochester, N. Y. Organic Chemicals Div.	Cleaning metal parts of oil and grease
Toluol or Acetone	AN-T-541 O-A-51b	Eastman Kodak Co. Rochester, N. Y.	Removing old EC-784 Cement
ADHESIVES			
Adhesive EC-784	MIL-A-140A	Minnesota Mining & Mfg. Co. Detroit, Michigan	Felt seal to cover Felt seal to case assembly Data panel to cover
Glyptol Cement #1276	----------	General Electric Co. Pittsfield, Mass.	Threads of machine screws Also used to hold magnets in position

PARTS LIST

The Group Assembly Parts Lists are listed in disassembly order. The list divides the components into major assemblies, their subassemblies and parts. By the use of indented columns, the relationship of the assemblies to the subassemblies and parts is obtained.

The column titled "Figure and Index No." contains the index number in disassembly order of the items illustrated. Do not use the figure or index number in correspondence--specify the catalog or part number and name. Finish should also be included where specified.

The column titled "nomenclature" (including numbered columns) lists item nomenclature on the Graflex drawing. The assembly in the column marked "3" will be a component of the first assembly which preceded it in the column marked "2" etc. The code "NP" will indicate that this part is "not procurable" and that the "next higher assembly" (NHA) should be ordered. The code "AR" is used for bulk items when an indefinite amount may or may not be used "as required. The code "LP" is used when an item may be "locally purchased."

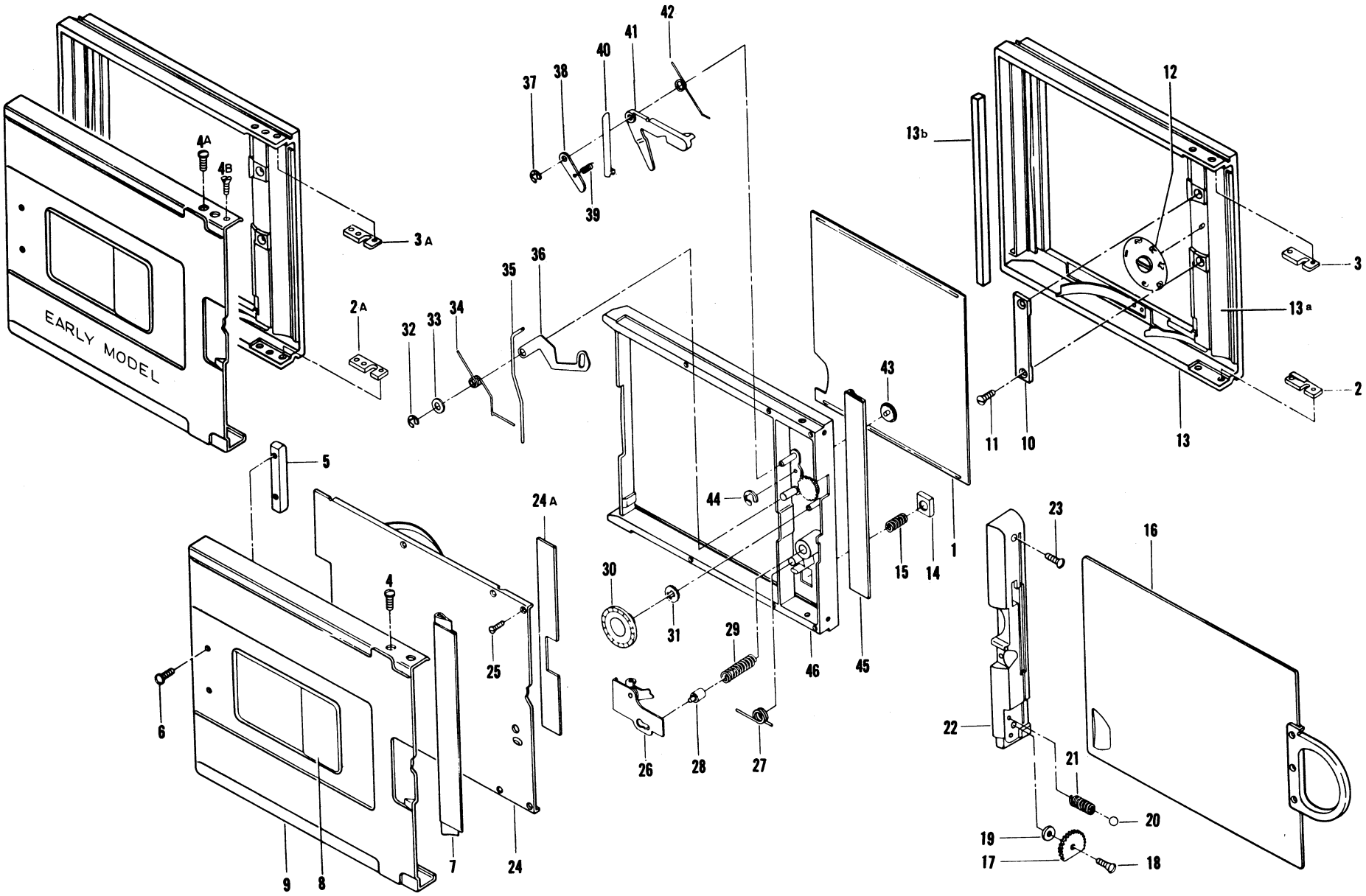


Figure 1. GRAFMATIC 45 (Exploded View)

Figure and Index No.	Part No.	1 2 3 4 5 Nomenclature	Qty.	
1-	32352G1	MAGAZINE COMPLETE - 4 x 5 GRAPHIC (Cat. 1268)	1	
	32352G2	MAGAZINE COMPLETE - 4 x 5 GRAFLEX (Cat. 1168)	DISCONTINUED	
-1	32385P1	. Septum - Film (Cat. 1588 for 1 ea. or Cat. 1560 for 6 ea.)	6	
-2	32381P1	. Plate - Lower Stop (CURRENT)	1	
-2A	32359G1	. Plate Assembly - Lower (EARLY)	1	
-3	32381P2	. Plate - Upper (CURRENT)	1	
-3A	32359G2	. Plate Assembly - Upper	1	
	Attaching Parts			
-4	30749P3	. Screw - Machine (special) CURRENT	4	
-4A	31843P2	. Screw - Machine (special) EARLY	4	
-4B	104-1-3L	. Screw - Machine (EARLY) No. 1-64 x 3/16 oval hd.	2	
		---***---		
-5	31841P1	. Stop - Septum	1	
	Attaching Parts			
-6	30921-5	. Screw - Self Threading, No. 2 x 3/16 pan hd., black oxide and black enamel L-40	2	(specify finish when ordering)
		---***---		
-7	31770G6	. Cutoff Assembly (3 dimples)	1	
		. Tape (cutoff)	LP	
-8	32383	. Panel - Data	1	
-9	32358P3	. Cover - Graphic (CURRENT)	1	
	32358P1	. Cover - Graphic (EARLY) no longer available - replace with 32358P3 and indices 2, 3&4	Ref.	
	32358P4	. Cover - Graflex (CURRENT)	1	
	32358P2	. Cover - Graflex (EARLY) no longer available - replace with 32358P3 and indices 2, 3 &4	Ref.	
-10	32375P1	. Retainer - Dial Assembly	1	
	Attaching Parts			
-11	124-2-3L	. Screw - Thread Forming, No. 2 x 3/16 flat hd. (was p/n 30921-P23L)	2	
		---***---		
-12	32372G1	. Dial Assembly	1	
-13	32353G4	. Case Assembly - Second (Graphic)	1	
	32353G5	. Case Assembly - Second (Graflex)	1	
-13a	31770G4	. . Cutoff Assembly (1 dimple)	1	
		. . Tape (cutoff)	LP	
-13b	32356P1	. . Seal	1	
	32357	. . Pin - Dial	NP	
		. . Case Assembly - First (Graphic)	NP	
		. . Case Assembly - First (Graflex)	NP	
	175-3-8K	. . . Rivet (spring was p/n 30363-P26K	6	
	32386P1	. . . Spring - Left (short)	1	
	32386P2	. . . Spring - Right (short)	1	
	32355P1	. . . Spring - Left (long)	1	
	32355P2	. . . Spring - Right (long)	1	
		. . . Case - Graphic	NP	
		. . . Case - Graflex	NP	
-14	33771P1	. Stop - Dark Slide	1	
-15	33772	. Spring - Stop	1	
	33838G1	. Drawer Complete	1	
-16	31767G2	. . Slide Assembly - Dark	1	
	176-3-9K	. . . Rivet (handle) was 30363-P14K	3	
	31769P1	. . . Handle - Slide	1	
		. . . Slide	NP	
-17	32387	. . Disc - Drawer Lock	1	
	Attaching Part			
-18	32388P1	. . Screw - Machine (special)	1	
		---***---		
-19	33500-52	. . Washer - Flat, 0.203 x 0.094 x 0.0080	1	
-20	300-4	. . Ball - Steel (0.09375 dia)	1	
-21	32389	. . Spring - Locking Disc	1	

Figure and Index No.	Part No.	1 2 3 4 5	Nomenclature	Qty.
1-22	32384P1	. .	Plate - Drawer	1
	Attaching Part			
-23	106B2-6K	. .	Screw - Machine, No. 2-56 x 3/8 round hd	1
	---***---			
-24	31771G2	. .	Cover Assembly	1
-24a	32392P1	. . .	Seal - Felt	1
	176-3-6K	. . .	Rivet (spring) was p/n 30363-P5	4
	31773	. . .	Spring - Drawer	2
		. . .	Cover - Drawer	NP
	Attaching Parts			
-25	31908	. .	Screw - Machine (special)	6
	---***---			
-26	31855G2	. .	Slide Assembly - Counter	1
-27	31859	. .	Spring - Counter Slide	1
-28	31860	. .	Stop - Slide	1
-29	30841	. .	Spring - Slide Stop	1
-30	32379P1	. .	Starwheel - Counter	1
-31	32380P1	. .	Gear Starwheel	1
-32	251-7	. .	Ring - Retaining	1
-33	30473-72	. .	Washer - Flat, 0.250 x 0.128 x 0.005	1
-34	32335P1	. .	Spring - Lock Lever	1
-35	32423P1	. .	Bar - Lock	1
-36	32277P1	. .	Lever - Lock	1
-37	251-7	. .	Ring - Retaining	1
-38	31852P1	. .	Detent	1
-39	31853	. .	Spring - Detent	1
-40	32376P1	. .	Latch	1
-41	32377P1	. .	Lever - Latch	1
-42	31848	. .	Spring - Latch	1
-43	32352G1M	. .	Magnet Gear Assembly	1
	Attaching Part			
-44	251-5	. .	Ring - Retaining	1
	---***---			
-45	31770G5	. .	Cutoff Assembly (2 dimples)	1
		. .	Tape (cutoff)	LP
-46	32361G1	. .	Drawer Assembly	1

GRAFMATIC® "23"

SHEET FILM HOLDER

SERVICE INSTRUCTIONS & PARTS CATALOG

JANUARY 1965

GRAFLEX | GENERAL PRECISION

GRAFLEX, INC. / A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION
ROCHESTER, NEW YORK 14603

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TABLE OF CONTENTS

PARTS LIST

1. INTRODUCTION

This section of the Service Parts Manual covers the Grafmatic "23". The text and illustrations cover disassembly, cleaning, reassembly, operations, troubles, and lubrication.

The Grafmatic film holder is an automatic magazine holding six individual sheets of cut film. Besides indicating the exposure number, it has an indicator to tell whether the film is in the exposed position or covered. If the Grafmatic holder is used in a 2-1/4 x 3-1/4 Graphic Back, an additional set of spacer washers may be required beneath the focusing panel springs at the point of attachment to the camera to allow easier insertion of the holder. Since Graphic Backs do not lock the Grafmatic in place, be careful not to pull the holder out or lift during the cycling operation.

2. OPERATION

Two movements are required - - PUSH and PULL. When pulling the slide or film compartment, pull straight outward -- not backward -- to avoid leverage pressure against the focusing panel or slide locks with possible danger of light leak. First check to see that the exposure counter dial is turned (use the edge of your thumb) so that number "1" appears, and that the chrome slide lock hook is turned to allow operation of the dark slide.

Pull the slide all of the way out and push it all of the way back. The first film septum will spring upward and be locked in the exposed position and the red dot at the back of the holder will be uncovered indicating that a film is in position ready for exposure.

After exposure the first film must be moved out of the way. To do this, press down with your thumb on the chrome latch, holding it against the slide handle, and PULL the entire film compartment all of the way out. Release the latch and PUSH the entire compartment in with the handle. When it is all of the way in, the exposure counter dial will move to No. 2. and the red dot will be covered indicating that the film is covered and the holder can be removed from the camera.

The same sequence is followed for all six exposures, after which an "X" will show on the exposure counter dial and the slide will be locked into the compartment indicating that you have made six exposures.

NOTE: The Grafmatic holder must be in the camera when the septums are being shifted. The film will be fogged if the film compartment is opened when the holder is not in the camera. To prevent accidental opening of the drawer, be sure the counter dial is set at a numbered position. To release the slide for recycling or loading turn the dial to No. 1.

To load or unload the Grafmatic film holder set the indicator dial on a number, press the chrome latch towards the handle and pull the film compartment out. Hold the compartment in this extended position, and PUSH the slide handle in until it releases the chrome latch, then PULL the slide out. The film septums have springs under them and will pop up. When loading the septums, keep the film notch over the notch at the open edge of the septum.

Before putting the septums back into the compartment, be sure that the counter slide, by the felt strip, has been pushed back out of the way, into the end of the film compartment.

CAUTION: When the holder is open for loading, note that slight pressure on the button on the underside of the film compartment will release the automatic exposure counter slide. If the holder is laid on a flat bench, no difficulty will be encountered; otherwise, it will be necessary to make sure that this slide does not extend into the septum chamber before attempting to insert the septums - failure to do so may result in jammed and bent septums.

When loading septums into the film compartment use the thumb and finger, holding them to act as a channel, guiding the septums down into place. All six septums must be in the compartment in order to operate the counting mechanism.

3. INSPECTION AND TROUBLES

Many troubles encountered by the repairman will be very obvious, while others will not be too apparent. The following table of potential troubles, causes, and remedies is supplied so that difficulties may be promptly recognized and proper steps taken to overcome them. Before disassembly check for loose or missing screws and sliding surfaces that are binding because of lack of lubrication.

TROUBLE	CAUSE	REMEDY
Drawer binds.	Lack of lubrication on edges.	Apply paraffin.
Drawer pulls out.	Missing drawer stop screws-screws work loose through vibration.	Replace parts - seal screws in place with Glyptol or lacquer.
Septums bent.	Improper loading or handling of septums.	Replace septums.
Light leak.	Cutoff assemblies damaged in disassembly.	Replace damaged cutoffs.
Counter dial does not work.	Less than six septums.	Add missing septums.
	Missing septum stop.	Replace.
	Missing counter slide.	Replace.
	Broken counter slide.	Replace.
Counter dial does not advance when septum is changed -- jumps back and forth.	Detent spring broken or missing.	Replace spring.
	Detent missing.	Replace detent.
	Detent spring unhooked.	Hook spring.
	Slide stop spring weak, broken or missing.	Replace spring.
Red dot does not appear when slide is withdrawn.	Broken counter slide spring.	Replace spring.
	Septum does not move forward.	Replace any bent or damaged septums.
Red dot does not disappear when drawer is operated.	Missing septum stop. Less than six septums.	Replace with new stop. Add missing septums.
Drawer latch does not operate but latch lever does.	Drawer latch spring broken.	Replace spring.
	Drawer latch spring unhooked.	Rehook spring.
Neither drawer latch lever nor drawer latch operates.	Drawer latch spring broken or unhooked and detent spring broken or unhooked.	Check and replace springs if necessary.

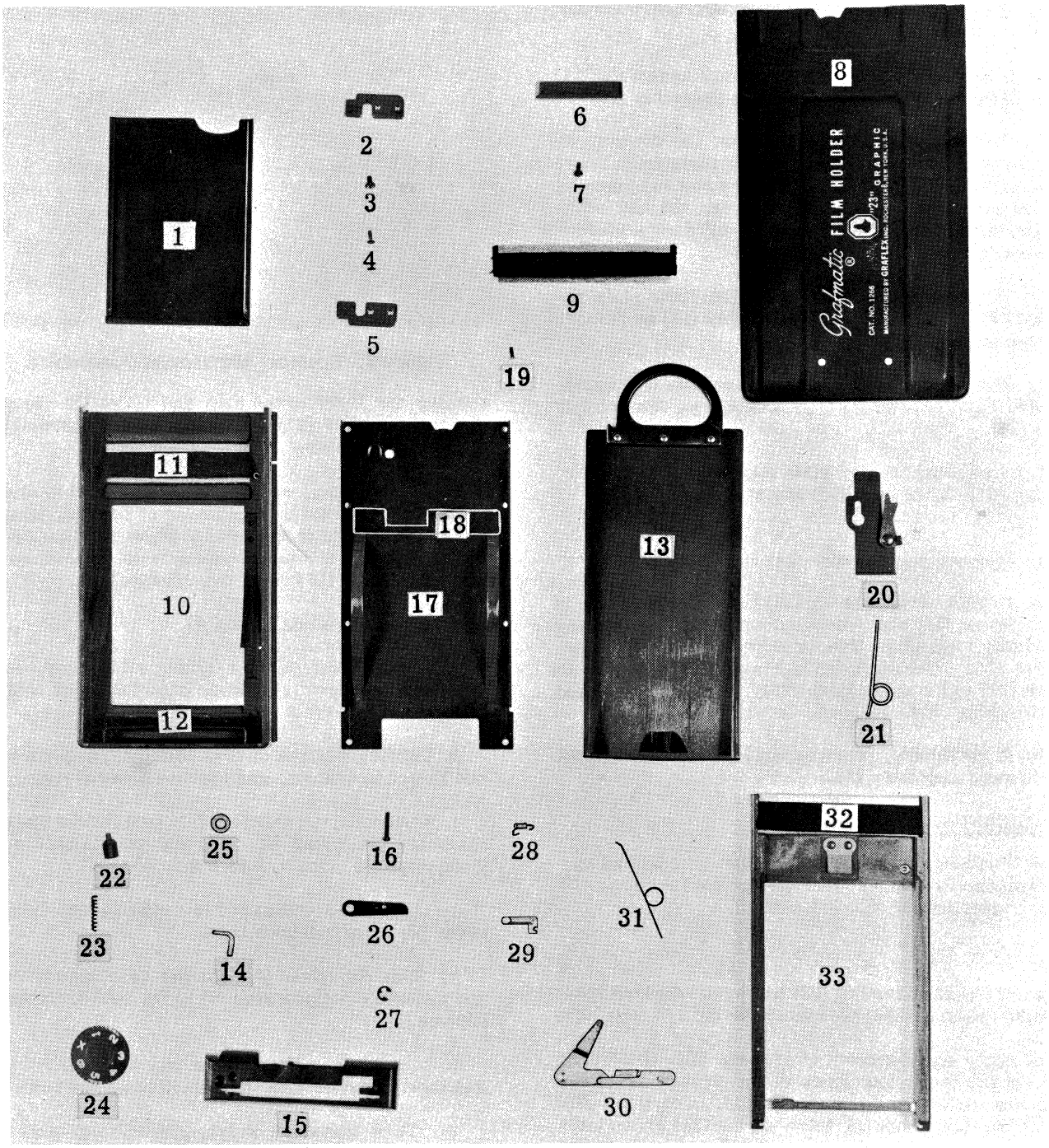

Figure 1. Grafmatic 23

4. DISASSEMBLY

a. Remove film septums (1).

b. Remove two drawer stop plates (2 and 5) by removing screws (3 and 4) and remove drawer from the Grafmatic by pulling straight out.

CAUTION: The dark slide (13) must be all the way in when the drawer is removed or the cutoff assembly (11) will be damaged.

c. Remove septum stop (6) by removing two screws (7).

d. Slide the cover (8) off the case assembly (10).

CAUTION: Insert a sheet of heavy paper or a film holder slide between the cover and case assembly before removing the cover to prevent damage to the cutoff assembly (9).

e. If necessary, remove the cutoff assembly (9) from the cover (8).

f. If necessary, remove the cutoff assembly (11) and the felt seal (12) from the case assembly (10).

g. Remove dark slide (13), from the drawer, by using a stop depressing plate (make plate from brass shim stock 0.006 in. thick, 1-1/2 x 4 inches) inserted to the end of the dark slide, between the half withdrawn dark slide and the drawer. Pull dark slide from the drawer.

h. If necessary, remove hook (14) from plate assembly (15). Remove plate assembly (15) by removing two screws (16).

i. Remove the drawer cover assembly (17) by removing eight screws (19). If necessary, remove felt seal (18).

j. Remove the counter slide assembly (20), counter spring (21), slide stop (22) and stop spring (23).

k. Remove counter dial (24) and washer (25).

l. Unhook detent spring (28) from notch on side of latch lever (30) and remove detent (26) by removing retaining ring (27). Unhook detent spring (28) from detent (26). Unhook latch spring (31) from notch on latch (29) and remove latch (29), latch lever (30) and latch spring (31).

m. If necessary, remove cutoff assembly (32) from the drawer assembly (33).

5. CLEANING

After disassembly, thoroughly clean all parts using chlorothene to remove all traces of old lubricants, toluol, acetone and EC-784 cement.

6. REASSEMBLY

a. If cutoff assembly (32) has been removed from drawer assembly (33) reassemble using 1/2 inch tape.

b. Apply small amount of grease, MIL-G-3278, to each of the two brass studs of the drawer assembly (33) and assemble latch spring (31), latch lever (30) and latch (29), hooking latch spring (31) under latch lever (30) and into notch of latch (29). Assemble detent spring (28) to detent (26) and assemble detent into place and secure with retaining ring (27). Hook detent spring to notch on side of latch lever (30).

c. Assemble washer (25) and counter dial (24).

d. Assemble stop spring (23) and slide stop (22). Apply small amount of grease, MIL-G-3278, to hole in lever of counter slide assembly (20). Assemble counter slide spring (21) to boss on drawer and insert the long end through hole on lever of counter slide assembly (20). Assemble counter slide assembly keeping the lever to the side and under the flange of the counter dial (24). See figure 2 for assembled counter mechanism.

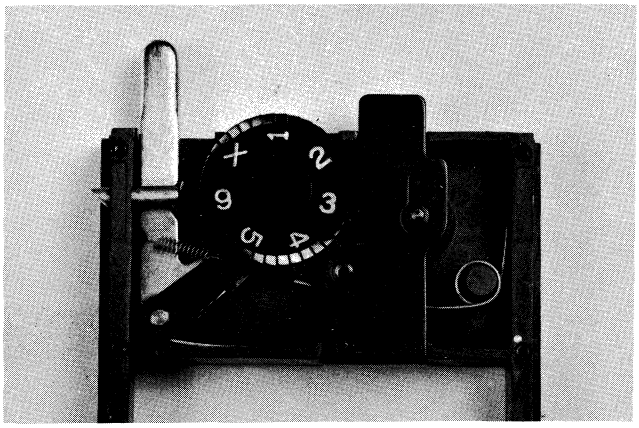

Figure 2. Counter Mechanism-Assembled

e. If necessary, recement felt seal (18) to drawer cover assembly (17). Apply drop of Glyptol, lacquer or shellac to eight screw holes in drawer and assemble cover assembly (17) using eight screws (19). Assemble plate assembly (15) using two screws (16).

f. Assemble slide hook (14).

g. Operate the counter slide, slide stop, latch lever and counter dial making sure that none of them bind due to incorrect assembly.

h. Lubricate edges of dark slide (13) with paraffin and insert in drawer, and operate several times.

i. If necessary, recement felt seal (12) to the case assembly (10) using EC-784, and reassemble cutoff assembly (11) using 1/2 inch tape.

j. If removed, reassemble cutoff assembly (9) to cover (8) using 1/2 inch tape.

k. Slide the cover (8) onto the case assembly (10) and assemble septum stop (6) to the cover, using two screws (7).

l. Slide the dark slide all the way down in the drawer and insert drawer into assembled case and cover.

m. Turn magazine on edge, with front magazine away from repairman, pull the drawer out half way, assemble the drawer plate stops (2 and 5) and apply a drop of Glyptol, lacquer or shellac to each of the screw holes and secure with screws (3 and 4).

NOTE: After assembly, wipe off any excess Glyptol, lacquer or shellac from edge of drawer.

n. Insert film septums (1) and check correct operation of drawer latch and drawer latch lever, proper cycling of septums, and correct operation of counter mechanism.

LUBRICANTS, CLEANING SOLVENTS, ADHESIVES

Materials are specified for general reference by U. S. Government Specifications. If the recommended material cannot be located, local suppliers can advise a substitute that meets a specification number.

COMPOUND	U. S. Government Specification	Manufacturer	Use or Application
LUBRICANTS			
Neolube	Not assigned.	Huron Industries Huron, Michigan	Drawer dark slide channels Counter slide Drawer stop plates
# 44 Silicone grease (light consistency) or Texaco Unitemp	---------- MIL-G-3278	Dow Corning Corp. Midland, Michigan Texas Co.	Hole in drawer for drawer latch Hole in lever of counter slide Brass studs of drawer
Paraffin	VV-P-121a	Socony Vacuum New York, N.Y.	Edges of drawer Edges of dark slide
SOLVENTS			
Chlorothene	----------	Dow Corning Corp. Midland, Michigan	Cleaning metal parts of oil and grease
Toluol or Acetone	AN-T-541 O-A-51b	Eastman Kodak Co. Rochester, N. Y.	Removing old EC-784 Cement
ADHESIVES			
Adhesive EC-784	MIL-C-4003	Minnesota Mining & Mfg. Company Detroil, Michigan	Felt seal to cover Felt seal to case assembly.
Glyptol Cement #1276	----------	General Electric Co. Pittsfield, Mass.	Threads of machine screws

PARTS LIST

The Group Assembly Parts Lists are listed in disassembly order. The list divides the components into major assemblies, their subassemblies and parts. By the use of indented columns, the relationship of the assemblies to the subassemblies and parts is obtained.

The column titled "Figure and Index No." contains the index number in disassembly order of the items illustrated. Do not use the figure or index number in correspondence--specify the catalog or part number and name.

The column titled "nomenclature" (including numbered columns) lists item nomenclature on the Graflex drawing. The assembly in the column marked "3" will be a component of the first assembly which preceded it in the column marked "2" etc. The code "NP" will indicate that this part is "not procurable" and that the "next higher assembly" (NHA) should be ordered. The code "AR" is used for bulk items when an indefinite amount may or may not be used "as required".

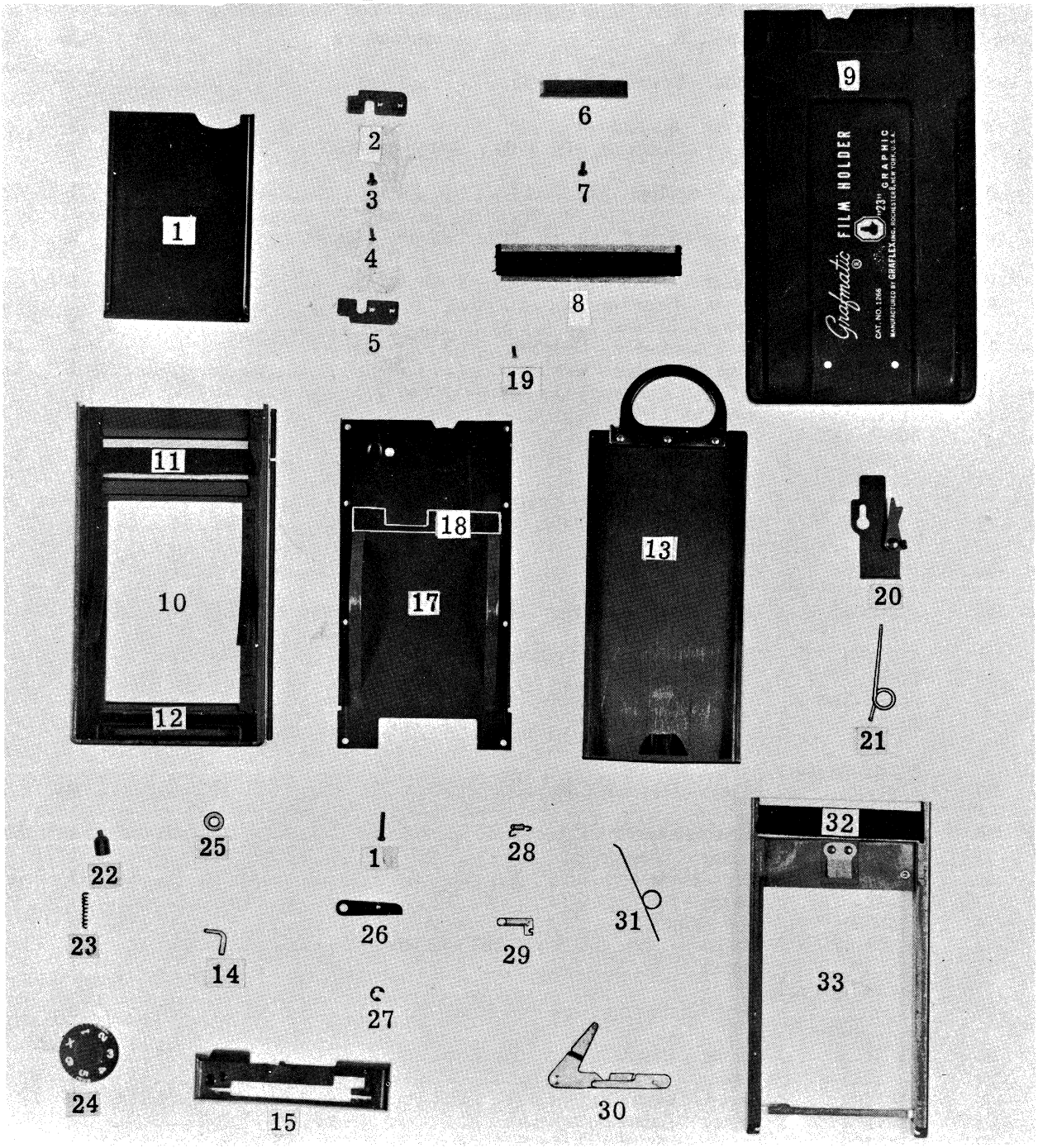

Figure 1. Grafmatic 23

Figure and Index No.	Part No.	1 2 3 4 5	Nomenclature	Qty.	Code
1-	31836G1		HOLDER COMPLETE - GRAPHIC "23" (Cat. No. 1266)	Ref.	
	31836G2		HOLDER COMPLETE - GRAFLEX "23" (Cat. No. 1166) Discontinued	Ref.	
-1	31775P1		. Septum - Film (Cat. No. 1586 for 1 ea. or Cat. No. 1558 for 6 ea.	6	
-2	31842P1		. Plate - Drawer Stop (right)	1	
	Attaching Parts				
-3	31843P2		. Screw - Machine (special)	2	
-4	104-1-3W		. Screw - Machine, No. 1-64 x 3/16, oval hd.	1	

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Figure and Index No.	Part No.	1 2 3 4 5	Nomenclature	Qty.	Code
1-5	31842P2	.	Plate - Drawer Stop (left)	1	
	Attaching Part				
-3	31843P2	.	Screw - Special	2	
-4	104-1-3W	.	Screw - Machine, No. 1-64 x 3/16, oval hd	1	
	---***---				
-6	31841	.	Stop - Septum	1	
	Attaching Part				
-7	30921-5W	.	Screw - Self Threading, No. 2 x 3/16, pan hd	2	
	---***---				
-8	31770G3	.	Cutoff Assembly (3 dimples - 2.690 lg.)	1	
-9	31840P1	.	Cover - Graphic	1	
	31840P2	.	Cover - Graflex	1	
-10	31837G1	.	Case Assembly - Graphic	1	
	31837G2	.	Case Assembly - Graflex	1	
-11	31770G1	. .	Cutoff Assembly (1 dimple - 2.234 lg.)	1	
-12	31777P1	. .	Seal - Light	1	
	30363-31K	. .	Rivet (spring)	4	
	31839P1	. .	Spring - Left	1	
	31839P2	. .	Spring - Right	1	
		. .	Case (Graphic or Graflex)	NP	NHA
-13	31767G1	.	Slide Assembly - Dark	1	
-14	31909	.	Hook	1	
-15	32397G1	.	Plate Assembly	1	
	Attaching Part				
-16	106B2-6K	.	Screw - Machine, No. 2-56 x 3/8, oval fillister hd	2	
	---***---				
-17	31771G1	.	Cover Assembly - Drawer	1	
-18	31854	. .	Seal - Counter	1	
	30363-25W	. .	Rivet (spring)	4	
	31773	. .	Spring - Drawer	2	
		. .	Cover	NP	NHA
	Attaching Part				
-19	31908	.	Screw - Machine (special)	8	
	---***---				
-20	31855G1	.	Slide Assembly - Counter	1	
-21	31859	.	Spring - Counter	1	
-22	31860	.	Stop - Slide	1	
-23	30841	.	Spring - Stop	1	
-24	31850P1	.	Dial - Counter	1	
-25	30473-41	.	Washer - Flat, 0.312 x 0.128 x 0.010	1	
-26	31852P1	.	Detent	1	
	Attaching Part				
-27	251-7	.	Ring - Retaining (was P/N 30241-2)	1	
	---***---				
-28	31853	.	Spring - Detent	1	
-29	31846P1	.	Latch	1	
-30	31847P1	.	Lever - Latch	1	
-31	31848	.	Spring - Latch	1	
-32	31770G2	.	Cutoff Assembly (2 dimples - 2.437 lg.)	1	
-33	31844G1	.	Drawer Assembly	1	