The

G.B.-Bell & Howell

8mm Camera

MODEL 605

Service and Instruction Manual

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8mm Camera

MODEL 605

Service Manual

Spare Parts List

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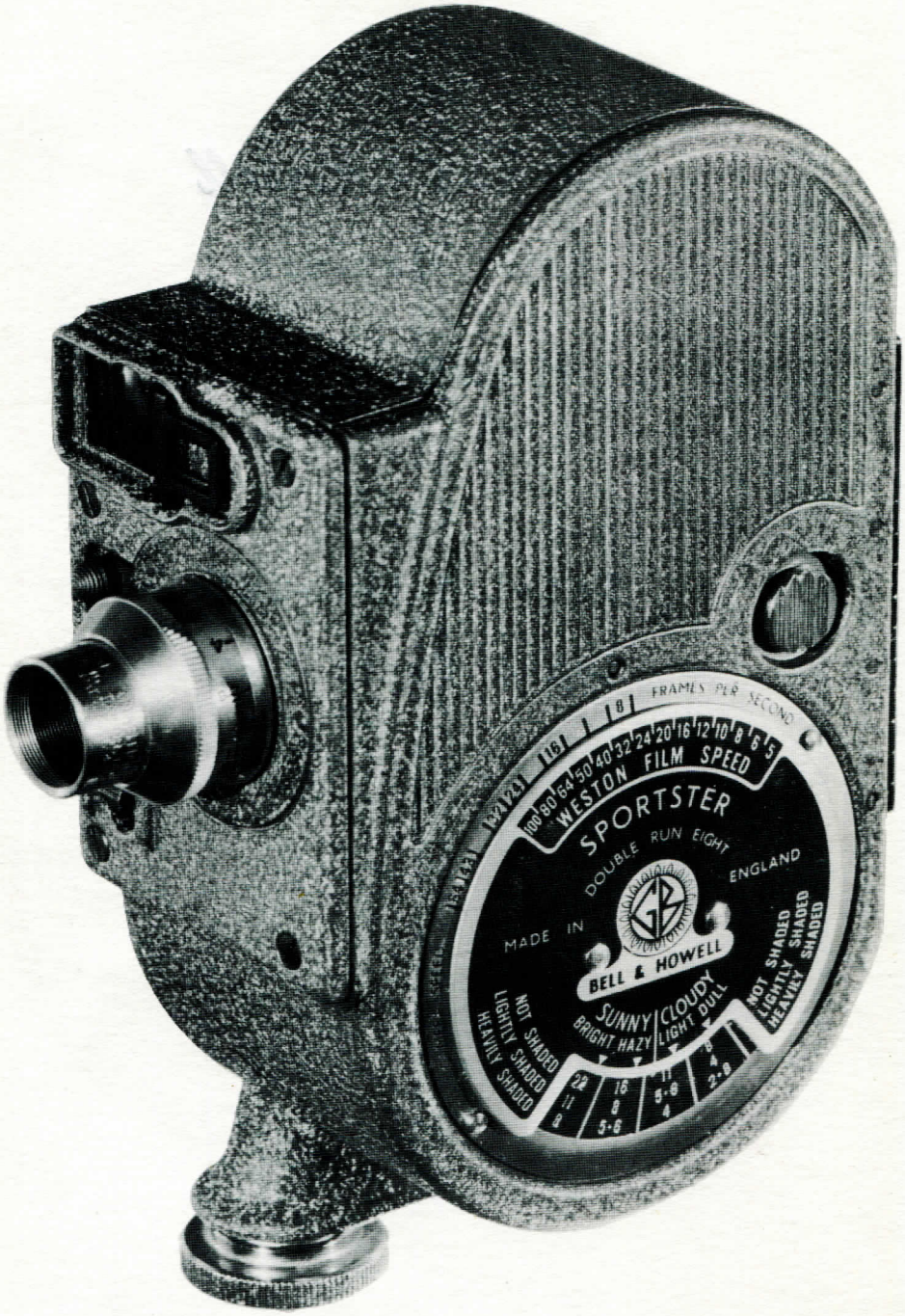


MODEL 605 8 mm "SPORTSTER" CAMERA

MODEL 605 "VICEROY" 8 mm CAMERA

INTRODUCTION

This manual has been prepared by G.B. Equipments Limited as an aid to the servicing and ordering of replacement parts for the G.B-Bell & Howell Model 605 (8-mm) Cameras. Two models are covered within this manual - Model S(Sportster) and Model TA (Viceroy).

The manual sets forth, in a step-by-step procedure, the approved method of disassembly, cleaning and repair, re-assembly, adjustments and final tests. The probability of ever having to disassemble a camera completely is very slight. Nevertheless, that probability has been taken into consideration in the preparation of the instructions contained herein. When making certain definite repairs and replacements, the service man will, of course, eliminate any unecessary steps in reaching and correcting the trouble. For example, to repair any part located beneath the camera mechanism plate (gears, spring motor, etc.) you first must remove the front plate from the camera. However, it will not be necessary to disassemble the front plate.

Before proceeding with the actual disassembly of the camera, the repairman should attempt to determine the extent of the work involved in repairing the unit. For the most part, he will be guided by customer complaints. The most common of these complaints are noisy operation, faulty take-up action and improper focal length adjustment.

Read this manual carefully before making repairs and then use it as a guide during the actual repair procedure. The photographs in the instruction portion of the manual illustrate the camera and its parts at various stages of assembly. These illustrations are lettered (Figure A,B,C, and so on).The exploded view illustrations at the rear of the manual are identified numerically (Figure 1,2,3 etc.). These views will aid you in identifying components for parts replacements Before and during the actual dismantling of the camera, carefully observe the manner in which the various parts are assembled as well as the function of those parts in relation to the camera as a whole.

Remember that the quality of service work performed will depend, to a large extent, upon the ability, ingenuity and care exercised by the service man doing the work.

Seemingly insignificant things such as the use of proper size screw drivers and the careful removal of parts may mean the difference between a good service job and a poor one. Remember, too, that your customer first judges the quality of the service performed by the general outward appearance of the repaired camera. Make certain that lenses and view finders are clean, and that spots where paint has chipped off have been touched up. Customer satisfaction is vitally important.

GUARANTEE.

This product is guaranteed for a lifetime. Any parts requiring replacement during the life of this product, as a result of defective material or workmanship, will be furnished and installed without cost (except transportation of the equipment). No liability is assumed for film which is damaged or is otherwise unsatisfactory.

GUARANTEE IS VOID:

(1)If adaptions or accessories of other than G.B. Bell & Howell recommendations have been made or attached.

(2)If equipment has not been registered with G.B. Bell & Howell.(Use card supplied with equipment.)

(3)If equipment has been serviced by other than an authorized G.B.Bell & Howell Service Agent.

LUBRICATION.

Lubricate only with G.B. Bell & Howell camera oil and/or grease. These lubricants

were developed especially for G.B. Bell & Howell cameras after extensive research, and will insure perfect operation and longer camera life.

It is very essential that only G.B.Bell & Howell camera oil be used. However, if this grease is not available, we recommend that the best possible grade of ball-bearing grease obtainable be used. Such grease must be free from dirt, grit or acids and must maintain its viscocity even after long usage.

SPECIAL SERVICE TOOLS.

The following tools will be supplied by G.B. Equipments Limited to the order of Service Agents:

S-14116-F1 Thread wrench for camshaft
S-10468-F3 Eyepiece assembly tool
S-10625-N4 Take-up tension gauge
S-10625-N5 Take-up tension gauge

We advise that the service man make the simple tools illustrated in figures E and F. A tweezers will prove invaluable when handling small parts. Once more we would like to stress the importance of using the proper size tools when dismantling or re-assembling the camera equipment.

MANUAL REVISIONS.

This manual is subject to revisions which may occur from time to time whenever improvements or changes in design are made. Such revisions automatically will be forwarded to agents for insertion in the manual. Keep your service manual up-to-date. Insert revision pages at once and place the obsolete pages in the back of the manual for possible reference when repairing obsolete model cameras.

DISASSEMBLY PROCEDURE

CAUTION

Before attempting any disassembly or repair work on the Model 605 camera, make certain that the spring motor is completely run down.

CAMERA DOOR ASSEMBLY (See Figure 1.)

a. Open the camera door and remove four screws (8592) that attach the door hinge to the camera frame.

b. Remove the four screws (9666) that fasten the door hinge (02437) and hinge barrier (6585) to the door casting.

c. Hold the gate closing spring (16221) with thumb and remove the two screws (4146). Then release the closing spring carefully to prevent the compression spring (10439) from popping out. Lift the closing spring, side tension shoe (8595) and compression spring from the cover.

d. The door latch button is staked in place and should not be removed unless the button, door latch or springs are in need of replacement.

FRONT PLATE AND PARTS - SPORTSTER.
(See Figure 1.)

a. Remove the four screws (10084) that fasten the front plate (02923) to the camera frame casting, and carefully pry the assembled plate from the frame.

b. The Sportster front plate is equipped with view-finder masks. To remove the masks, take out pilot screw and lift the masks from the pin in the bottom of the view-finder opening.

c. Take out the five fillister head screws (8568) from the back of the front plate, and carefully lift off the lens latch plate assembly (02531). Remove the lens lock latches (04467) and (04468) and latch springs (8570) from the back of the lens plate assembly.

d. Pry the tension spring (10587) from its slot in the back of the front plate. The camshaft bearing need not be pressed from the front plate unless definitely in need of replacement.

e. Lift the stop pawl spring (14952) and stop pawl (02921) from the camera frame. Remove and examine the gasket (11138), objective (9461) and objective spring (8579). If necessary, replace the felt oiler located in the camshaft bearing opening in the front plate.

FRONT PLATE AND PARTS - VICEROY ONLY
(See Figure 4.)

a. Remove the lens mount covers (11061 and 11081) from the turret plate (11067).

b. Remove the turret plate screw (11065) and shims from the centre of the turret plate. Be careful not to lose any of the shims - the same amount and thickness of shims must ne replaced when reassembling the camera. Work the turret plate (11067) slowly from the front stud.

c. Lift the roller (11062) and spring (11063) from the front plate. Take out the three small screws (11077) and one long screw (11078) that fasten the front plate (03068) to the camera frame casting and lift off the front plate.

d. With a spanner wrench, remove the re-

tainer nut, thus freeing the critical focuser assembly. Do not disassemble the focuser. Pry the tension spring (10587) carefully from the back of the front plate.

e. Remove the stop pawl spring (14952) and stop pawl assembly (03061) from the camera frame.

FILM GATE, MECHANISM PLATE & SPRING MOTOR. (See Figures 2 & 3.)

a. (Figure 2) Carefully insert a small screw driver or knife blade under one end of gate hinge retaining spring and pry up just enough to allow hinge pin of film gate (02530 - Fig.2.) to pass. Repeat procedure with other end of spring and lift out the film gate.

b. (Figure 3.) Hold the winding key flat against the side of the camera and remove the hub screw (8582).The winding key (8522), hub (10915)and spring washer (8521) are now free. Pry the motor key plate (02565)carefully from the camera frame with a knife blade.

c. (Figure 2.)Remove the three fillister head screws (8589 and 8590) that hold the gear cover. Take out the three flat head screws, (14899 - not illustrated) grasp feed reel post with thumb and forefinger, and lift the mechanism plate (04421)out of the camera frame. Unscrew and remove the door lock head (14980)and shim washer (12085)from the post on the mechanism plate.

d. (Figure 2.)Make a careful note of the manner in which the take-up drive assemblies (02025) are installed in relation to the mounting plate(04474), take-up sleeve(04470)and spring motor (04493). Then remove the mounting plate (04474), take-up sleeve(04470), take-up drives ((02025), spring motor (04493) and winding gear (14913) from the camera frame.

e. (Figure 2.) Remove the fillister head screw (15572) that fastens the end of the clutch spring (8561) to the boss inside the camera frame. Then remove the shoulder screw (8506), spring (8561), hold back gear (8509) and washer (16548) from the camera frame.

APERTURE PLATE, SHUTTER AND CAMSHAFT

a. (Figure 2.) Remove the four fillister head screws (10268) and carefully pry the aperture plate (04524) away from the camera frame. Be very careful not to scratch the film-contact surface of the aperture plate during this operation.

b. (Figure 1.) Hold the camshaft gear to prevent the camshaft from turning,and unscrew the shutter(04492)by gripping the shutter stop with thumb and forefinger and turning shutter counterclockwise. Be very careful not to bend shutter during the removal.

c. (Figure 1.)Remove the three flat head screws(14920)and lift out the shutter retainer (8572) carefully so that the compression spring (4085)does not pop out. Remove the compression spring and the shim washer (10939). Lift out the shuttle (8573) and booster pawl assembly (02920).

d. (Figure 1.) Remove the fillister head screw (7495) and lift out the booster pawl spring (10862).

e. (Figure 2.) Remove the two fillister head screws (3923) end the camshaft bushing clamp (14935) so as to release the pressure from the camshaft bearing (8544). Unscrew and remove the camshaft bearing (8544) from the back of the camera frame with the S-14116-F1 thread wrench. Be careful not to lose the steel ball (6715) that is located inside the bearing. Revolve the governor with the fingers until the camshaft (04413) can be shifted toward the front of the camera and lifted out.

f. (Figure 1.) The Sportster camera is equipped with a rectangular viewfinder tube (8564R). This tube is not fastened into the camera frame and can be slid out of the front of the casting. It may be necessary to turn the speed control dial to low speed in order to allow sufficient clearance for the tube to pass by.

g. (Figure 4.) The view - finder tube (04496) for the Viceroy model camera is held in place with a clamp and screw assembly. Loosen the screw (10699) and press the clamp (11082) through the front of the camera frame. The view-finder tube (04496)now can be removed through the front opening in the frame. If the camera has a rubber eyepiece, remove before attempting to slide the tube forward.

CAUTION

Do not attempt to remove the tube (04496) from rear of camera by unscrewing as this will cause the tube to come apart inside the camera. The view-finder tube must not be disassembled at any time.

GOVERNOR, GEARS AND DIALS.

a. (Figure 2.) Remove the two fillister head screws (7495) that fasten the bearing plate (04348) to the raised bosses inside the camera frame, and lift out the bearing plate.

b. (Figure 2.) Lift the first compound gear (14713) out of the frame. Note the lubricating felt which is located in the gear mounting hole. This felt need not be removed. Lift out the assembled spur and scroll gears. The spur gear (14712R) and shim washer (14714) can be pressed from the scroll gear (14711). Note the lubricating felt (14723) inserted into a hole in hub of scroll gear as well as the felt (10575 - not illustrated) pressed up inside the gear itself. These need not be replaced. Set the speed control knob to its fastest speed. Loosen the two set screws (14904 and 14945) and remove the governor bearings(14896 and 9452)with the S-14116-F1thread wrench. Rear bearing (14896) will come out of the back of the camera. Front bearing (9452) can be removed from raised post in camera frame by shifting the governor toward the front of the camera until the bearing can be grasped with the fingers. Be very careful not to lose the steel balls (6715) that are located inside the bearings - one in the rear bearing and two in the front bearing. Shift the governor toward rear of camera until governor pinion gear enters the rear bearing opening. Lift up on the front end of the governor (02623)and pull forward to remove.

c. (Figure 2.) Remove the fillister head screw (9665) that fastens the lower drive shaft bearing (6568) to the camera frame. Then remove the fillister head screw(6563), drive shaft retainer (8763) and drive shaft spring (8762) at the top of the drive shaft (02519) and lift shaft from the frame.

d. (Figures 2 & 3.) Take out the grooved head screw (8514) and washer (8771) and lift out the speed control bracket spring (6564).
Remove the fillister head screw (8125) and spring washer (9458) from inside the camera and pull the speed control knob (025084) and washer (11018) from the camera frame. Lift out the brake slide assembly (8546).

NOTE

Whenever the governor is replaced or the speed setting is disturbed in any manner, the speed control knob may have to be replaced and the new knob re-marked as instructed under "Timing Adjustment", page 12.

e. (Figure 2.) Do not disassemble the brake shoe assembly (01905) except for replacement of parts. Should disassembly be necessary, remove the two fillister head screws (14955)that hold together the parts of the assembly - brake shoe strap (9455) brake shoe (01905) from brake slide (8546).
Remove cork pad (13668) if worn.

f. (Figures 2 & 3) Remove the fillister head screw (10787) and ratchet (8779) from inside the camera and press the filmmeter dial (M50279) and spring washer (10801) from the frame.

g. (Figure 1.) The Sportster model is equipped with a finder eye lens(9460R) which screws into the back of the camera. This lens can be removed with the S-10468-F3 lens tool.

h. (Figure 3.) Unscrew the carrying cord assembly (04488) from the camera frame (04527).

CLEANING AND REPAIR

CLEANING

Completely remove old grease and oil from all the camera parts by washing with a good cleaning solvent. Then dry parts thoroughly with a clean, lint free cloth to remove cleaning fluid. The most reliable method of drying parts is with dry, compressed air.

To remove emulsion or an accumulation of hardened dirt from the aperture plate, gate plate and the aperture opening, use a spatula-shaped piece of wood.

CAUTION

Never use a metal tool to remove emulsion from the aperture plate, gate plate or aperture opening. Be very careful not to bend the gate plate out of shape,even to the slightest degree.

Clean the view-finder objective and eyepiece with lens polishing cloth or tissue moistened with lens cleaning fluid.

REPAIR

Inspect the aperture plate and gate plate through a magnifying glass for nicks and scratches. A light buffing with jeweller's rouge sometimes will remove minor abrasions. Do not attempt to polish out deep pits or scratches because changes in the thickness of the aperture plate will affect the focal distance. If either plate is nicked or scratched to any great extent,it must be replaced with a new one.

Carefully examine all gears for signs of excessively worn or broken teeth. Damaged gears must be replaced with new ones. This examination also should include the governor and camshaft pinions as well as the filmmeter drive shaft worm.

Inspect the filmmeter drive shaft and the camshaft to make certain that they have not become bent. These shafts can be straightened by hand if extreme care is used.

Examine the camera frame and door for obvious cracks that might admit light to the film chamber. These items must be replaced if such damaged is found.

Springs and spring washers which have become weakened through constant use must be replaced with new ones.

Carefully examine the take-up drive discs by spreading the lips of each disc apart with a thin knife blade. Tension must be geat enough so that the lips grasp the knife blade firmly.

REASSEMBLY PROCEDURE

GOVERNOR, GEARS AND DIALS

a. (Figure 3.) The carrying cord assembly (04488) can be assembled to the camera frame (04527) at any time during the reassembly procedure.

b. (Figure 4.) VICEROY MODEL ONLY: Screw the new eye shade assembly (03042)into the back view-finder opening.

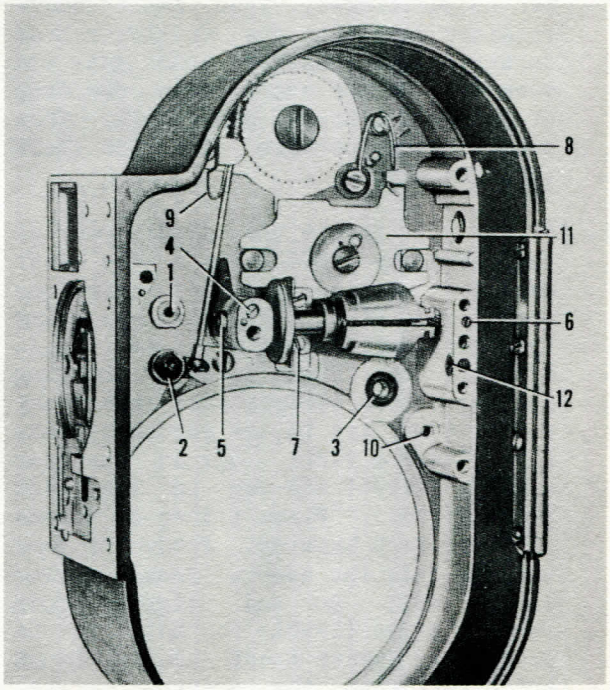
c. (Figures 1.) SPORTSTER MODEL ONLY:Screw the eye lens assembly (9460R) into the back view-finder opening in the camera frame with the S-10468-F3 eye lens tool.

d. (Figures 2 & 3.) Place spring washer (10801) over hub of filmmeter dial (M50279) and press dial into place in camera frame. Hold dial firmly in position and instal ratchet (8779) to dial hub with the fillister head screw (10787).

e. (Figures 2 & 3) Apply a thin coat of Bell & Howell camera grease to bosses in bottom of camera frame on which the brake slide (8546) will rest. If a new cork pad (13668 not illustrated) was needed, cement the new pad to the brake shoe,and trim off the edges with a sharp knife after cementing. Fasten the brake shoe (01905) and strap(9455) to the brake slide with the two fillister head screws (14955). Place the brake slide assembly in position on the brake slide studs in the camera frame. Instal the washer (11018) on hub of speed control knob (025084) and insert cam-like hub through camera frame and brake slide. Hold these parts in place and instal spring washer (9458) so that the oblong hole in the washer fits over the stud in hub. Then secure all parts with the fillister head screw (8125).

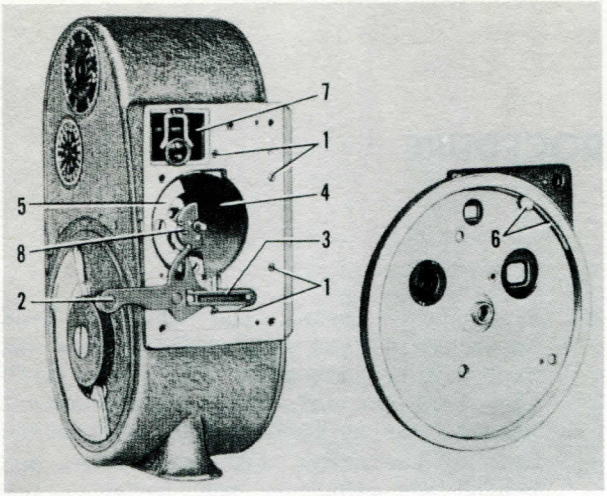
f. (Figure 2.) Instal the grooved head screw (8514) and washer(8771) into the tapped hole just above the brake slide. Then hook one end of the speed control bracket spring (6564)around the grooved head of the screw and the other end behind the stop on the brake slide (See Figure A). Turn the speed control knob to the highest speed.

g. (Figure 2.) Place the filmmeter drive shaft (02519)in position on the bottom of the camera frame and secure the lower end of the shaft with the shaft bearing (6568)and fillister head screw



1. Instal compound gear here
2. Instal scroll gear here
3. Instal clutch gear here
4. Gov. front bearing set screw
5. Governor front bearing
6. Gov. rear bearing set screw
7. Brake shoe adjusting screws
8. Speed control bracket spring
9. Drive shaft spring
10. Fasten clutch spring here
11. Brake-slide
12. Camshaft rear bearing

Figure A. Governor, Brake-Slide and Dials Installed



1. Aperture plate screw
2. Stop pawl
3. Stop pawl spring
4. Shutter
5. Shuttle retainer
6. Indexing roller and spring
7. Viewfinder tube clamp
8. Shutter stop

Figure B. Shutter, Shuttle and Stop Pawl Installed - VICEROY

(9665). The spur gear at the bottom of the shaft must fit in slot in bearing. Hold the drive shaft spring (8762) in place until the shaft retainer (8763) can be positioned. Then fasten shaft retainer down with the fillister head screw (6563). Oil the spur gear and worm gear of the shaft with one drop of G.B-Bell & Howell camera oil. Then check to make certain that the shaft turns freely.

h. (Figure 2.) Insert the small gear of the governor (02623) into the rear governor bearing opening, lower the front end of the governor and bring the front end forward until it is inserted in the front governor bearing opening. Make certain that the steel balls (6715) are in the governor bearings (14896 & 9452) - one in the rear bearing (14896) and two in the front bearing(9452). Place a drop of camera oil into each bearing. Press the rear bearing into the camera frame as far as it will go and tighten down the set screw (14904)- to hold it in position. Insert front bearing (open end first) into the opening in the forward side of the bearing post and tighten down the set screw (14945)just enough to hold bearing.

i. (Figure 2.) Press lubricating felts (14723 & 10575) in place - two in the scroll gear (14711) and one in the camera frame opening where the first compound gear is to be installed.(This opening is in the raised boss just forward of and slightly above the spur end of the worm shaft.) Saturate these felts with G.B-Bell & Howell camera oil. Assemble the shim washer (14714) and crown and spur gear (14712R)to the idler and scroll gear (14711) and instal this assembled group onto the raised stud just forward of the worm shaft spur gear. Then instal the compound gear (14713) so that the small pinion engages the scroll gear and the large pinion engages the spur gear. Instal bearing plate (04348) over the gears and fasten it in place with the two screws (7495).

APERTURE PLATE, SHUTTER & CAMSHAFT

a. (Figure 4.) VICEROY MODEL ONLY: Slide the view-finder tube into the front view-finder opening until it seats within the aperture at the back of the frame. Instal the tube clamp (11082) so that the clamp tongue rests on ridge of rectangular view-finder opening and the clamp legs straddle the tube. Then instal screw (10699) and tighten until tube is held rigidly in place. (See Figure B.)

b. (Figure 2.) Loosen the set screw that holds the front governor bearing in place and shift governor toward front of the camera as far as it will go. Insert threaded end of camshaft(04413) down and into the front opening in camera frame; then move it toward rear of camera until gear end of shaft enters rear camshaft bearing opening. Insert steel ball (6715) into rear camshaft bearing (8544) and lubricate with one drop of G.B-Bell & Howell camera oil. Then screw the bearing about three-fourths of the way into the frame. With a knife blade or similar instrument press the front governor bearing into the bearing post until there is a barely perceptable amount of end play,(.003 to .005 ins.) of the governor shaft in the bearings. Then tighten the front bearing set screw securely.

c. (Figure 2.) Position the bushing clamp (14935) on the raised boss just above rear camshaft bearing so that small stud on underside of clamp rests against the bearing. Fasten loosely in place with the fillister head screws (3923).

d. (Figure 1.) Place the camera frame on a work bench with the front of the camera facing up. Fasten the booster pawl spring (10862) in place with the fillister head screw (7495). Place the booster pawl(02920), the washer(10939) and the spring (4085) over the booster pawl stud in that order and lubricate with one drop of G.B-Bell & Howell camera oil. Place the shuttle (8573) in position and lubricate sparingly at the points where the shuttle will ride against the guide pins and the shuttle retainer (8572).

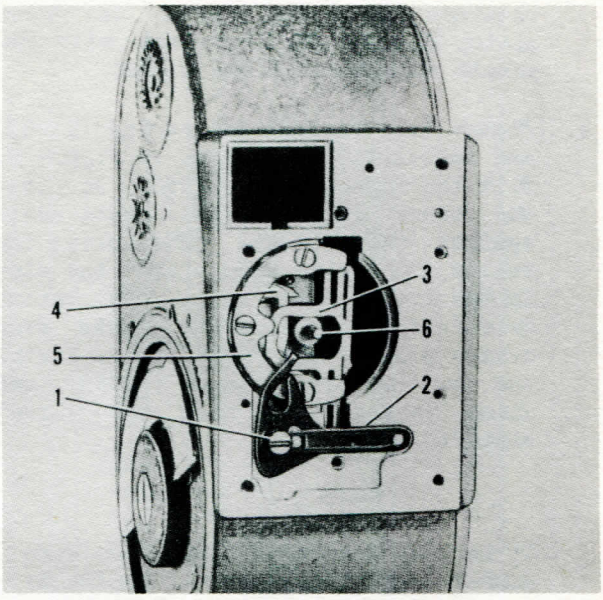
e. (Figure 1.) Position the shuttle retainer (8572) over the three screw holes in the front of the camera frame and check to make certain that the compression spring (4085)s still is in place. Secure the retainer with the three flat head screws (14920). Check the shuttle freedom. The shuttle must have a minimum of up and down movement but at the same time must move back and forth quite freely. (See Figure C.)

f. (Figure 1.) Hold the shutter (04492) in place on end of camshaft by gripping the shutter stop between thumb and forefinger. Then turn the camshaft gear (not the shutter) until the shutter is screwed firmly onto the end of the camshaft.

g. (Figure 2.) Place the aperture plate (04524)in position on the inside of camera frame, making certain that it is seated solidly on all the small studs. Then secure it with the four fillister head screws (10268) inserted from front of camera.

FRONT PLATE - VICEROY ONLY

a. (Figure 4.) Instal the stop pawl (03061) and stop pawl spring (14952) to the stud on the front of the camera. The long pin of the stop pawl must be



1. Stop pawl
2. Stop pawl spring
3. Shuttle
4. Booster pawl
5. Shuttle retainer
6. Camshaft

Figure C. Proper Installation of Shuttle Retainer and Booster Pawl - SPORTSTER

inserted into the hole at the lower end of the booster pawl.

b. (Figure 4.) Put a small amount of white vaseline on the bronze tension spring (10587) to hold it in position and place the spring in the recess on the underside of the front plate (03068).

c. (Figure 4.) Carefully place the front plate on the front of the camera so that the bearing in the centre of the plate fits down over the protruding end of the camshaft. Press the front plate down firmly and check to see that it is seated solidly on all sides. Add a drop of G.B-Bell & Howell camera oil at the bearing.
Secure the front plate with the one long fillister head screw (11078) at the upper right-hand corner and the three shorter screws (11077)within the circle of the plate.

d. (Figure 4.) Hold the critical focuser assembly so that the slot in the side of the focuser tube rests over the guide pin on the back side of the front plate. Then screw the round retainer nut firmly in place. Be very careful not to burr the edge of the

retainer nut or the hole in the front plate, as this may interfere with the smooth operation of the turret.

e. (Figure 4.) Install the spring (11063) and roller(11062)as shown in Figure B. Tilt the turret plate (11067) so that the inner edge of the plate rests against the roller. Then press the roller and spring back into the slot in the front plate until the centre hole in the turret plate rests over centre post of the front plate. Instal the turret plate screw (11065) and shims (various) to hold the turret plate in position.

NOTE

It is very important that the same number and thickness of shims be reinstalled as was removed during disassembly of the camera. This will insure the correctness of the focal length and the parallel dimensions of the camera.

f. Check the focal dimensions of the camera as instructed elsewhere in this manual. Then instal the lens covers (11061 & 11081) to the front plate.

FRONT PLATE - SPORTSTER
(See Figure 1 & Figure C.)

a. The camera lens can be used to good advantage when reassembling the front plate. Assemble the lens plate(02531) to the lens and invert these two parts so that the recesses for the lens lock latches (04468 & 04467) are facing up. Place the latches in position on the studs so that they engage the lens mount. Then press the latch springs (8570) into place between the latches and the rim of the plate. Be careful not to let these two springs escape. Carefully fasten the lens plate to the front plate (02923) with the five fillister head screws (8568). Now remove the lens by compressing the two lens latches.

b. Place the view - finder centralizing spring M50211 in position over the view-finder eye lens (9460R), already installed. Insert the rectangular view-finder tube (8564R) through the front of the view-finder opening in the camera frame. The back end of the tube must rest evenly over the centralizing spring.

c. Place the objective spring (8579) and view-finder objective (9461) in the objective opening in the camera frame. Insert the gasket (11138) into the objective opening in the front plate.

d. Place the stop pawl (02921) in position on front of camera so that the pin on underside of starting button is inserted into the hole at the lower end of the booster pawl. Instal the stop pawl spring (14952) over the stud in camera frame. with legs of spring straddling the extrusion of the stop pawl.

e. If the front camshaft bearing (12883) was in need of replacement, press the new bearing into the front plate. Put a small amount of white vaseling on the bronze tension spring (10587) to hold it in position and place it in the recess on the underside of the front plate.

f. Carefully place the front plate in position on the front of the camera so that the front camshaft bearing rests over the end of the camshaft. Press the front plate down firmly and check to make certain that it is seated solidly all the way round. Check the focal dimension of the camera as instructed in the following paragraph.

CHECKING CAMERA FOCAL LENGTH.
(See Figure D.)

a. The camera focal length is measured from the inside surface of the aperture plate (the surface against which the film rides) to the machined surface of the lens seat. The focal length of the Model 605 camera is .300 ins (-.0005 in.), and it is very important that this dimension be accurately maintained.

b. Before checking the focal length, make certain that both the aperture plate and front plate are properly seated. Check the focal length with a dial

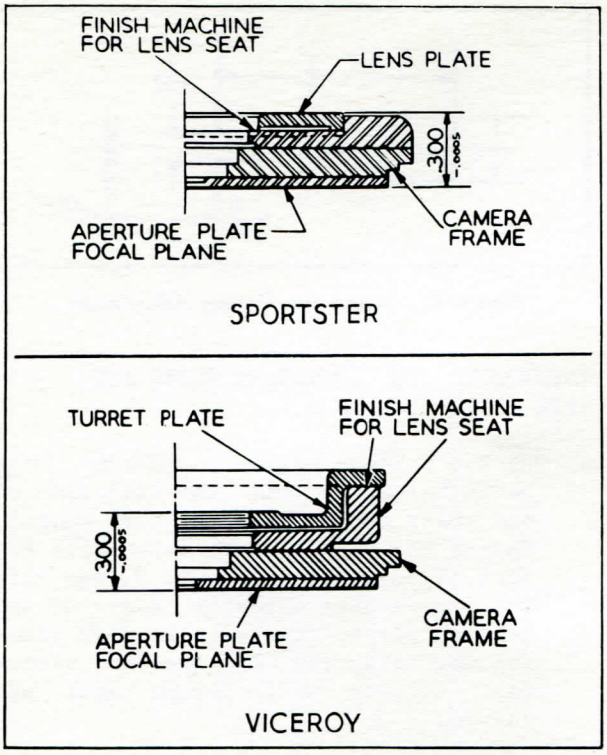


Figure D. Camera Focal Length Adjustment

indicator, depth gauge or other available indicator that will register accurately within the necessary .0005 ins. tolerance.

c. If the indicator reading is less than the required dimension, shims may be inserted under the aperture plate until the reading is correct. If the indicator reading exceeds .300 inch, the surface of the front plate against which the lens plate rests must be cut down slightly. This can only be done if a lathe and lathe faceplate are available at the service station and the cut removed from the lens plate seat must be very exact. After the cut has been made, clean the lens plate seat by blowing away residue with dry, compressed air and polish surface with jeweller's rouge.

NOTE

When making the above focal measurements, be sure that there are no particles of dust on the aperture plate, lens seat or the indicator instrument.

SPRING MOTOR AND WINDING GEAR

a. (Figure 2.) Apply a coat of G.B-Bell & Howell camera grease to the inside of the hold-back clutch spring (8561) and instal spring onto hub of hold-back gear (8509). Insert the shoulder screw (8506) through the gear, place the washer (16548) over threaded end of screw and fasten the group to the bottom of the camera frame. Fasten the loop end of the hold-back spring to the boss at the back of the camera frame with the fillister head screw (15572).

b. (Figure 3.) Apply a thin coat of camera grease to the underside of the spring winding gear (14913) where it will rest on the casting and also to the gear of the spring motor (04493). Insert the winding gear teeth and motor into the camera frame.

c. (Figure 3.) Apply a thin coat of camera grease to the inside surface of the key plate (02565) where it will rest against the casting. Hold the spring motor firmly in place and invert the camera. Position the winding key (8522) on the key plate so that the two ends of the key rests on the bosses. Place the spring washer (8521) into the winding key hub (10915) and instal the hub so that the notches in the hub fit over the ends of the key. Secure the hub with the hub screw (8582). The winding key should lie flat against the key plate under tension. If it does not do so, the spring washer (8521) has been inserted into the key hub upside down. Correct this condition.

CAMSHAFT AND GOVERNOR ADJUSTMENT

a. (Figure 2.) Screw in the rear camshaft bearing (8544) with the S-14116-F1 thread wrench until there is approximately .003 to .005 ins. end-play of the shaft in the bearings. This can be checked by shifting the camshaft back and forth.

b. (Figure 2.) When the proper adjustment has been made, tighten down the two clamp attaching screws (3923) to lock the camshaft bearing in place.

c. Grasp the camera with the fore-finger against the end of the spring motor shaft and wind the motor three or four turns. Run the camera to check for general operation.

d. The hole in the rear governor bearing (14896) is off-centre and thus acts as an eccentric adjustment for the meshing of the governor and camshaft gears. Thus, if the noise is too great or too uneven, this bearing can be adjusted to its quietest point by loosening the set screw (14904) and revolving the bearing slowly until the smoothest operation is obtained.

TIMING ADJUSTMENT

a. Set the speed control dial index mark on the dividing line between the 32 and 48 speed spaces.

b. Insert the setting gauge (see Figure E.) between the governor disc and the brake shoe, move the brake shoe up against the gauge and tighten the two brake shoe attaching screws securely.

c. With the spring motor completely run down, wind the spring motor eight complete turns of the winding key. The chart below will indicate the number of seconds necessary for the spring motor to run down at the various speeds. Check both the high and low speeds to make certain that all speed markings will fall within their allotted spaces.

Speed	Time
16	21.75 sec.
32	11.00 sec.
48	7.25 sec.
64	5.50 sec.

d. If the speed is too fast or too slow (speed will not drop as low as 16 frames per second or go as high as 64 frames per second), the brake shoe can be moved toward or away from the governor disc until all speeds can be marked on the dial.

e. Calibrate each speed and mark the new dial with a very sharp punch. Fill in the marks with black paint sc that they are easily discernable.

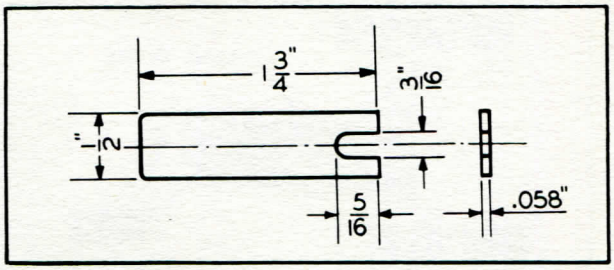


Figure E. Guage for Timing Adjustment

TAKE-UP DRIVES, MECHANISM PLATE AND GATE PLATE (Figure 2.)

a. The two take-up drives (02025) must be installed so that the flat side of the brass centre bearings face upward. Spread the lips of each drive with the tool illustrated in Figure F. and slip the drives over opposite edges of the take-up sleeve (04470). Be very careful not to spread lips too far, otherwise tension will become weak and uneven.

b. Instal the take-up sleeve over the spring post of the spring motor. Once again spread the lips of the two take-up drives and very carefully engage the drives with the flange of the spring motor drum.

NOTE

The two drives must be in perfect alignment (parallel with the camshaft) so that the disc studs on the underside of the disc mounting plate(04474) will engage the bearing in the centre of each take-up drive. Make certain that the drives are engaging both the flange of the spring motor drum and the flange of the take-up sleeve as shown in Figure F.

c. Instal the disc mounting plate (04474) as shown in Figure G. Lay the mechanism plate (04421) down into place so that the two holes on either side of the take-up sleeve opening rest over the studs on top of the mounting plate. Make certain that the mechanism plate is down solidly and fasten in place with the three flat head screws (14899 not illustrated.). Assemble the door lock head (14980) and shims (12085)

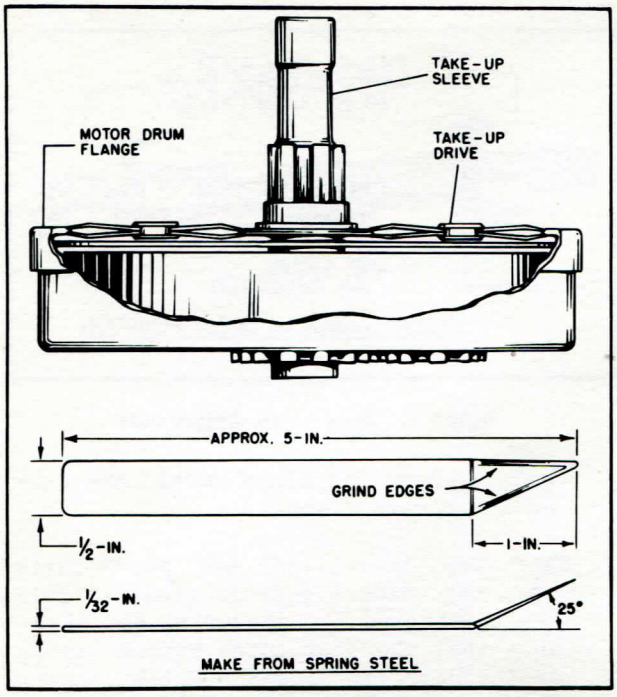


Figure F. Installation of Take-up Drives

to the door lock post of the camera mechanism plate.

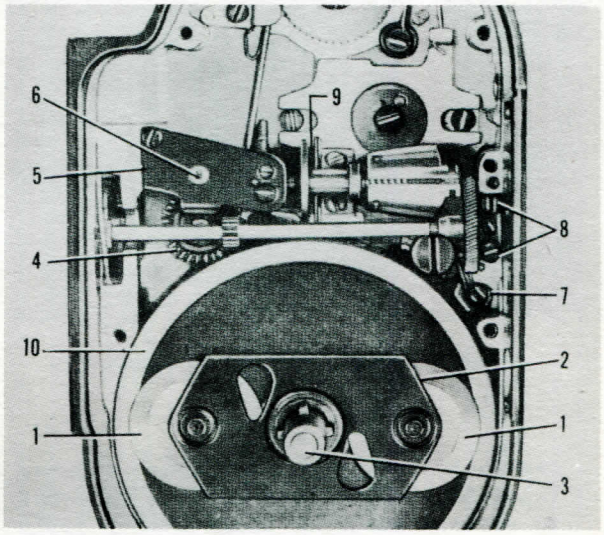
d. Fasten the gear cover (14916)in place with the three fillister head screws (8589 & 8590). The two longer screws (8590) must be inserted at the back end of the cover.

e. Check the take-up tension with the take-up gauges, S-10625-N4 and N5. Place the camera on the the gauge block and instal the gauge onto the take-up sleeve as shown in Figure H. With the camera running, gauge arm should swing to the centre of the three index marks or very close to it. If this condition is not met, the take--up drives (02025) are probably faulty and should be replaced.

f. Insert the film gate (02530) into the camera so that the gate hinge pins rest against the ears of the gate hinge spring on the aperture plate. Apply sufficient pressure to each pin to force it under the hinge spring.

CAMERA DOOR (See Figure 1.)

a. Place the compression spring (10439) into the hole in the tension shoe boss. Assemble the side tension shoe (8595) to the gate closing spring (16221) so that the two lugs on the underside of the spring engage the two rectangular openings in the tension shoe. Make certain that the raised bosses on the ears of the tension shoe face upward. Thus they will ride on the edge of the film when the door is closed.



1. Take-up drives
2. Friction disc mounting plate
3. Take-up sleeve
4. Crown and spur gear
5. Bearing plate
6. Shaft of 1st compound gear
7. Clutch spring attaching screw
8. Camshaft brg. clamp screw
9. Insert timing adj. gauge here
10. Flange of spring motor

Figure G. Spring Motor, Gears and Take-up Drives Installed

b. Position the shoe and spring on the raised boss with the tongue of the shoe resting on the compression spring and start the two screws (4146) in the tapped holes. Press the long arm of the gate spring so that it catches behind the die-cast stop on the edge of the door. Press the closing spring and tension shoe as far toward the front edge of the door as possible and tighten the screws securely.

c. Place the flat side of the hinge (02437) against the camera door. (Offset side fastens to the camera frame). Position the door hinge barrier (6585) on the hinge so that the angled portion of barrier faces up and is nearest rear edge of door. Fasten the barrier and the hinge to the door with the four fillister head screws (9666). Then fasten the door hinge to the

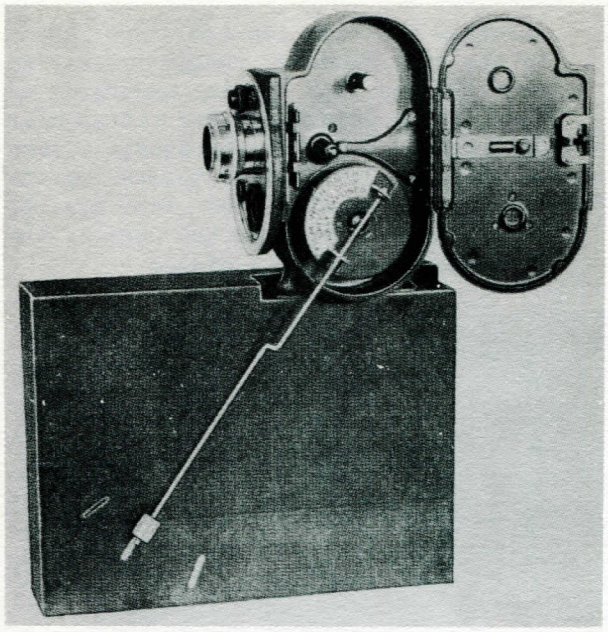


Figure H. Checking Take-up Tension

camera frame with the four shorter fillister head screws (8592). In order to prevent possible light leaks, apply a coat of heavy black lacquer to all

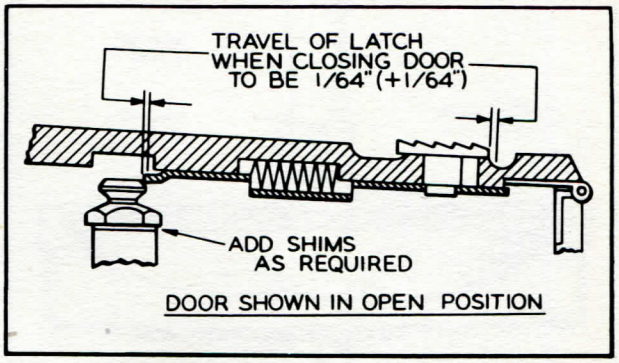


Figure J. Door Latch Adjustment

points where the hinge meets the door or the camera frame.

d. Check the travel of the door latch when the camera door is closed. This can be checked by measuring the distance that the door latch button moves as the door is closed. Latch travel should be 1/64 in. (+ 1/64 in.); or a maximum of 1/32 in. (see Figure J.). If the latch travels too far during closing of door, remove the door lock head (14980 - Figure 2) and add shims until the proper travel is obtained.

FINAL TEST

LIGHT LEAK TEST

If the customer complains of film-fogging, check the camera for light leaks as follows: Insert a short length of dark-room loading film (at least equal in sensitivity to Eastman Super XX) and close the camera door. Place the camera on a bench or table, door side facing up, and encircle it with floodlights. Expose camera to the light for approximately 15 minutes, turning the camera frequently to make certain that all sides are equally exposed. Before removing the film from the camera in the dark room, make some identifying mark on the film which will permit it to be replaced in the camera in the same position it occupied during the exposure. This will help you to find the source of the light leak if film-fogging is evident. Develop the film and examine it carefully for signs of fogging. If caused by cracks in frame or cover, those items must be replaced.

CAMERA RUN TEST.

Load the camera with test film and wind the spring motor fully. Set the filmmeter dial on zero and allow the camera to run down. Camera must run a minimum of $4\frac{1}{2}$ feet and a maximum of $5\frac{1}{2}$ feet before stopping. If this standard is not met, the main drive spring and spring motor are out of adjustment. Replace the spring motor with a new one.

PHOTO TEST.

Load the camera with fine-grain, positive film and test the general performance and photographic quality of the camera. There must be no out-of-time condition of the shutter and the image must be no more than .010 in.out of frame. No continuous or broken film scratch shall be permissible.

STEADINESS TEST.

Steadiness must be tested with the film being fed and taken up in a manner at least equivalent to that in normal use. Maximum vertical unsteadiness must not be greater than .0008 in.at 16 and 24 speeds, .001 in. at 32 speed and .0012 in. at 64 speed. Maximum horizontal unsteadiness must not exceed .0005 in.

The

G.B.-Bell & Howell

8mm Camera

MODEL 605

SPARE PARTS CATALOGUE

Where part numbers on illustrations have been amended these are noted in the parts list. All orders for spares must bear both part numbers and description

G.B. - BELL & HOWELL

MODEL 605 8mm CAMERA.

SPARE PARTS LIST.

Part No.	Description.
01905.	Shoe Assembly, Brake.
02025.	Take-up Drive Assembly.
02437.	Door Hinge Assembly.
02519.	Film Meter Drive Shaft Assembly.
02530.	Film Gate & Shoe Assembly.
02531.	Lens Plate & Stud Assembly.
02565.	Plate, Spring Motor Key (With Studs fitted).
02623.	Governor Assembly.
02920.	Booster Pawl Assembly.
02921.	Stop Pawl Button Assembly.
02923.	Front Plate Assembly.
03042.	Shade Assembly, Eye.
03061.	Pawl & Button Assembly, Stop.
03068.	Plate Assembly, Turret Front (complete).
04348.	Plate & Bushing Assembly Bearing.
04413.	Shaft & Governor Drive Gear Assembly, Cam.
04421.	Plate Assembly Mech.
04467.	Latch Assembly, Lens Lock (Left.).
04468.	Latch Assembly, Lens Lock (Right).
04470.	Sleeve Assembly Take-up.
04474.	Plate Assembly, Friction Disc Mounting.
04477.	Lens Assembly, Objective.
04488.	Cord Assembly, Carrying.
04492.	Shutter, Cam & Stop Assembly.
04493.	Motor Assembly, Spring complete.
04496.	Tube Assembly, Viewfinder.
04524.	Plate & Guide Studs Assembly (Aperture).
04527.	Case Assembly, Camera. (Sportster).
04529.	Case Assembly, Camera (Viceroy).
04530.	Door & Latch Assembly.
04827R.	Lens Assembly.
04899.	Lens Assembly.
025047.	Camera Spool Assembly.
025084.	Knob Assembly, Speed Control.

Part No.	Description.
M025137.	Exposure Guide Dial Assembly (Bottom).
3923.	Screw, Fill. Head.
4085.	Spring, Compression.
4146.	Fill. Head Screw.
5385.	Brush Aperture.
6563.	Screw. Fill. Head.
6564.	Spring, Speed Control Bracket.
6568.	Bearing, Worm Shaft Lower.
6585.	Barrier Door Hinge.
6715.	Ball Steel.
7495.	Screw, Fill. Head.
8125.	Screw, Fill. Head.
8506.	Screw Shoulder.
8509.	Gear, Spring Hold Back.
8514.	Screw, Grooved Head.
8521.	Washer, Spring.
8522.	Key, Winding.
8544.	Bearing, Cam Shaft (Rear).
8546.	Slide, Governor Brake.
8561.	Spring, Hold Back Clutch.
8564R.	Tube, Viewfinder.
8568.	Screw, Fill. Head.
8570.	Spring Latch.
8572.	Retainer Shuttle.
8573.	Shuttle.
8579.	Spring, Viewfinder Objective.
8582.	Screw, Fill. Head.
8589.	Screw, Fill. Head.
8590.	Screw, Fill. Head.
8592.	Screw, Fill. Head.
8595.	Shoe, Side Tension.
8762.	Spring Shaft.
8763.	Retainer Shaft.
8771.	Washer.

Part No.	Description.
8779.	Ratchet.
9452.	Bearing, Governor (Front).
9455.	Strap, Brake Shoe.
9458.	Washer, Speed Control Spring.
9460R.	Viewfinder, Ocular for 12½m.m.Lens.
9461.	Objective, Viewfinder for 12½m.m.Lens.
9665.	Screw, Fill. Head.
9666.	Screw, Fill. Head
10084.	Screw, Fill. Head.
10268.	Screw, Fill. Head
10439.	Spring Compression.
10575.	Felt, Lubricating.
10587.	Tension Spring.
10699.	Screw Clamp.
10759.	Washer.
10787.	Screw. Fill. Head.
10801.	Washer, Spring.
10862.	Spring, Booster Pawl.
10915.	Hub Winding Key.
10939.	Washer.
11018.	Washer.
11061.	Cover Objective Lens Mount.
11062.	Roller.
11063.	Spring.
11065.	Screw 10-40 Special.
11067.	Plate, Turret.
11076.	Shim.
11077.	Screw 3-48 Fill. Head.
11078.	Screw 3-48 Fill. Head.
11081.	Cover. Photo Lens Mount.
11082.	Clamp.
11093.	Shim.
11138.	Gasket.
12085.	Washer, Shim.

Part No.	Description.
12942.	Lens Cap.
14711.	Gear, Idler & Scroll.
14712R.	Gear, Crown & Spur.
14713.	Gear, 1st Compound.
14714.	Washer, Shim.
14723.	Felt, Lubricating.
14896.	Bearing, Governor (Rear).
14904.	Headless Set Screw.
14913.	Gear Spring Winding.
14916.	Cover, Gear.
14920.	Screw, Flat Head.
14922.	Spring Top Gate Hinge.
14925.	Spring Gate Hinge.
14935.	Clamp, Cam Shaft Bushing.
14943.	Screw. 2-64 Fill. Head.
14945.	Screw, Cone Point.
14952.	Spring, Stop Pawl.
14955.	Screw 1-72 Fill. Head.
14980.	Head Door Lock.
15572.	Screw, Fill. Head.
16221.	Spring Gate Closing.
16249.	Shims.
16461.	Stud.
16548.	Washer.
20492R.	Dial Exposure Guide (Top).
M50211.	Viewfinder Centralizing Spring.
M50279.	Dial Film Meter.
M50433.	Dial Exposure Guide (Top).
M50556.	Rivet Semi Tubular.
M50587.	Felt, Friction.

The

G.B.-Bell & Howell

8mm Camera

MODEL 605

ILLUSTRATIONS

G. B. BELL & HOWELL
MODEL 605 SPORTSTER CAMERA

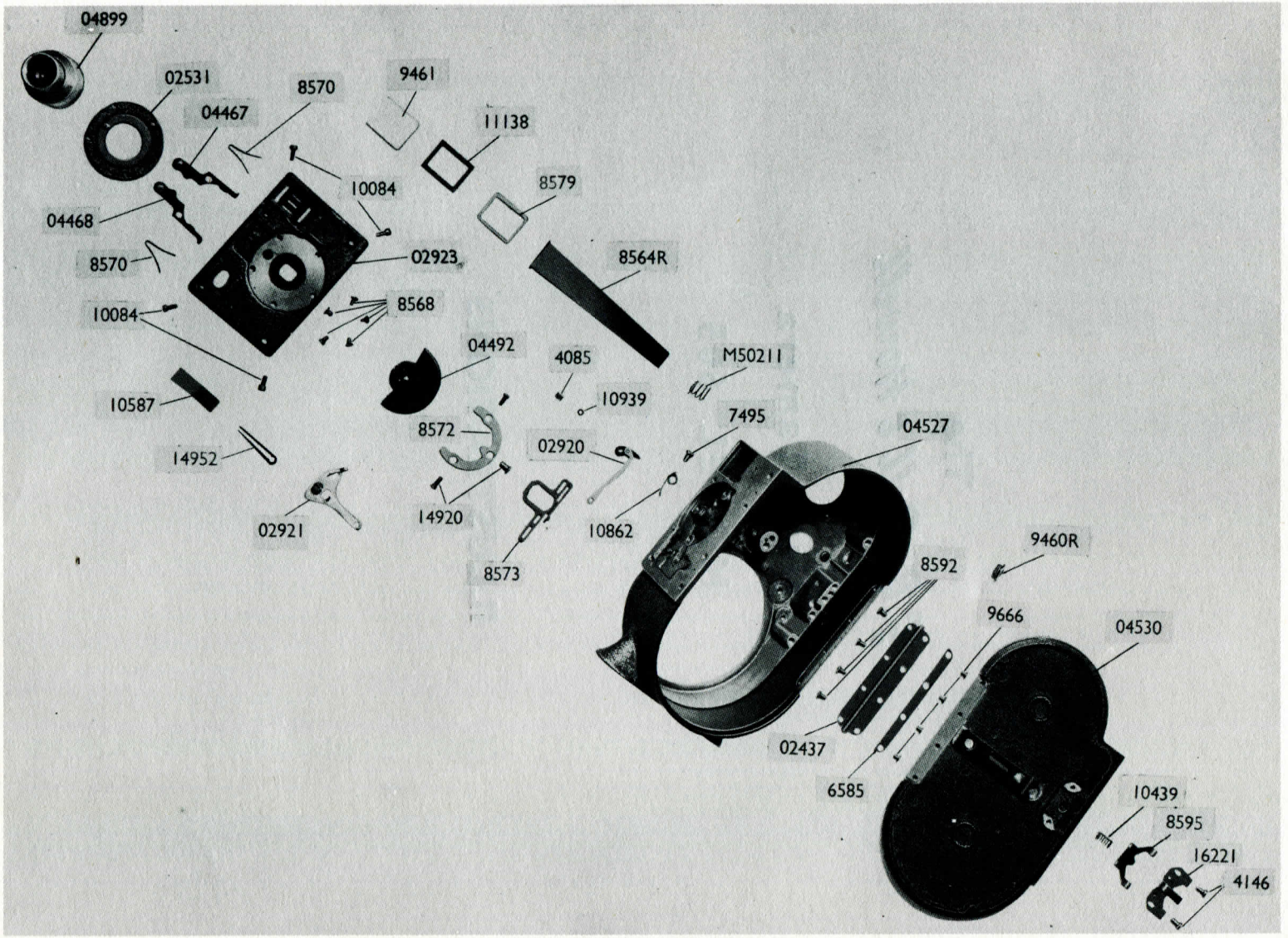


FIG. 1

MODEL 605 SPORTSTER CAMERA.

Figure 1.

Part No.	Description.	Part No.	Description.
02437.	Door Hinge Assembly.	8572.	Retainer Shuttle.
02531.	Lens Plate & Stud Assembly.	8573.	Shuttle.
02920.	Booster Pawl Assembly.	8579.	Spring, Viewfinder Objective.
02921.	Stop Pawl Button Assembly.	8592.	Screw. Fill. Head.
02923.	Front Plate Assembly.	8595.	Shoe, Side Tension.
04467.	Latch Assembly, Lens Lock (Left).	9460R.	Viewfinder, Ocular for 12½m.m.Lens.
04468.	Latch Assembly, Lens Lock (Right).	9461.	Objective Viewfinder for 12½m.m.Lens.
04492.	Shutter, Cam & Stop Assembly.	9666.	Fill. Head Screw.
04527.	Case Assembly, Camera (Sportster).	10084.	Screw. Fill. Head.
04530.	Door & Latch Assembly.	10439.	Spring Compression.
04899.	Lens Assembly.	10587.	Tension Spring.
4085.	Spring Compression.	10862.	Spring Booster Pawl.
4146.	Fill. Head Screw.	10939.	Washer.
6585.	Barrier Door Hinge.	11138.	Gasket.
7495.	Screw. Fill. Head.	14920.	Screw, Flat Head.
8564R.	Tube Viewfinder.	14952.	Spring, Stop Pawl.
8568.	Screw. Fill. Head.	16221.	Spring Gate Closing.
8570.	Spring Latch.	M50211.	Viewfinder Centralizing Spring.

Serial No. and type must always be quoted when ordering spares.

MODEL 605 SPORTSTER CAMERA.

FIGURE 2.

Part No.	Description.
01905.	Shoe Assembly, Brake.
02025.	Take-up Drive Assembly.
02519.	Film Meter Drive Shaft Assembly.
02530.	Film Gate & Shoe Assembly.
02623.	Governor Assembly.
04348.	Plate & Bushing Assembly Bearing.
04413.	Shaft & Governor Drive Gear Assembly, Cam.
04421.	Plate Assembly Mech.
04470.	Sleeve Assembly Take-up.
04474.	Plate Assembly, Friction Disc Mounting.
04493.	Motor Assembly, Spring complete.
04524.	Plate & Guide Stud Assembly, (Aperture).
04527.	Case Assembly (Sportster).
3923.	Screw. Fill. Head.
6563.	Screw. Fill. Head.
6564.	Spring, Speed Control Bracket.
6568.	Bearing, Worm Shaft Lower.
6715.	Ball, Steel.
7495.	Screw. Fill. Head.
8125.	Screw. Fill. Head.
8506.	Screw Shoulder.
8509.	Gear, Spring Hold Back.
8514.	Screw, Grooved Head.
8544.	Bearing, Cam Shaft (Rear).
8546.	Slide, Governor Brake.
8561.	Spring Hold Back Clutch.
8589.	Screw, Fill. Head.
8590.	Screw. Fill. Head.
8762.	Spring Shaft.
8763.	Retainer Shaft.
8771.	Washer.
8779.	Ratchet.
9452.	Bearing, Governor (Front).
9455.	Strap, Brake Shoe.
9458.	Washer, Speed Control Spring.
9665.	Screw. Fill. Head.
10268.	Fill. Head Screw.
10575.	Felt, Lubricating.
10759.	Washer.
10787.	Screw, Fill. Head.
12085.	Washer, Shim.
14711.	Gear, Idler & Scroll.
14712R.	Gear, Crown & Spur.
14713.	Gear, 1st Compound.
14714.	Washer, Shim.
14723.	Felt, Lubricating.
14896.	Bearing, Governor (Rear).
14904.	Headless Set Screw.
14913.	Gear Spring Winding.
14916.	Cover, Gear.
14922.	Spring Top Gate Hinge.
14925.	Spring Gate Hinge.
14935.	Clamp, Cam Shaft Bushing.
14943.	Screw. 2-64 Fill. Head.
14945.	Screw, Cone Point.
14955.	Screw. 1-72 Fill. Head.
14980.	Head, Door Lock.
15572.	Screw. Fill. Head.
16548.	Washer.

Serial No. and type must always be quoted when ordering spares.

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MODEL 605 SPORTSTER CAMERA

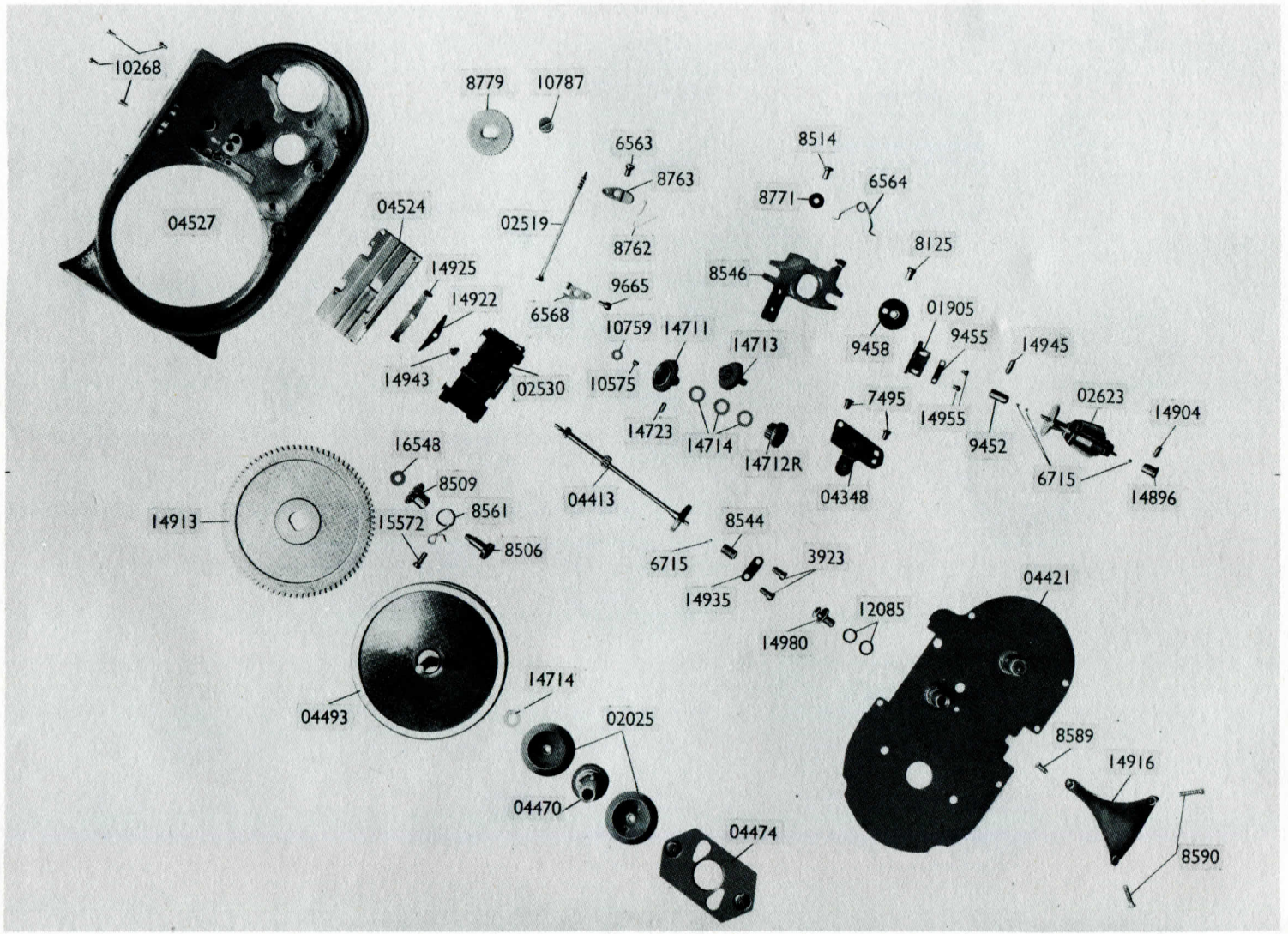

FIG. 2

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MODEL 605 SPORTSTER CAMERA

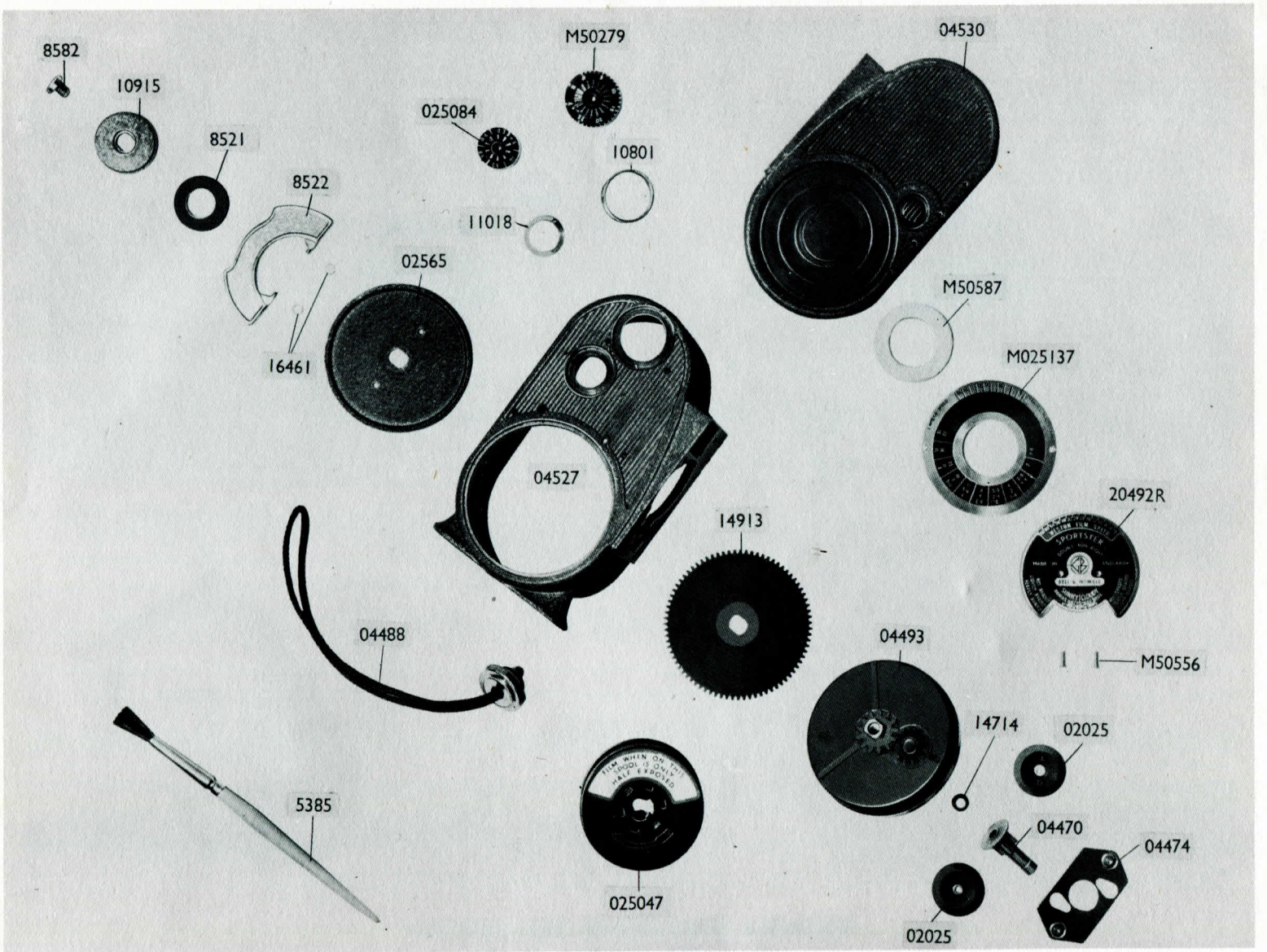

FIG. 3

MODEL 605 SPORTSTER CAMERA.

FIGURE 3.

Part No.	Description.	Part No.	Description.
02025.	Take-up Drive Assembly.	8522.	Key Winding.
02565.	Plate, Spring Motor Key (With Studs fitted).	8582.	Screw. Fill. Head.
04470.	Sleeve Assembly Take-up.	10801.	Washer, Spring.
04474.	Plate, Assembly, Friction Disc Mounting.	10915.	Hub Winding Key.
04488.	Cord Assembly, Carrying.	11018.	Washer.
04493.	Motor Assembly, Spring complete.	14714.	Washer Shim.
04527.	Case Assembly, Camera (Sportster).	14913.	Gear Spring Winding.
04530.	Door & Latch Assembly.	16461.	Stud.
025047.	Camera Spool Assembly.	20492R.	Dial Exposure Guide (Top).
025084.	Knob Assembly, Speed Control.	M50279.	Dial Film Meter.
M025137.	Exposure Guide Dial Assembly (Bottom).	M50556.	Rivet Semi Tubular.
5385.	Brush Aperture.	M50587.	Felt, Friction.
8521.	Washer, Spring.		

Serial No. and type must always be quoted when ordering spares.

MODEL 605 VICEROY CAMERA.

FIGURE 4.

Part No.	Description.
03042.	Shade Assembly, Eye.
03061.	Pawl & Button Assembly Stop.
03068.	Plate Assembly, Turret Front (complete)
04477.	Lens Assembly, Objective.
04496.	Tube Assembly, Viewfinder.
04529.	Case Assembly Camera, (Viceroy).
04827R.	Lens Assembly.
M025137	Exposure Guide Dial Assembly (Bottom).
10587.	Tension Spring.
10699.	Screw, Clamp.
11061.	Cover Objective Lens Mount.
11062.	Roller.
11063.	Spring.
11065.	Screw 10-40 Special.
11067.	Plate, Turret.
11076.	Shim.
11077.	Screw 3-48 Fill. Head.
11078.	Screw 3-48 Fill. Head.
11081.	Cover, Photo Lens Mount.
11082.	Clamp.
11093.	Shim.
12942.	Lens Cap.
14952.	Spring Stop Pawl.
16249.	Shims.
M50433.	Dial Exposure Guide (Top).
M50556.	Rivet Semi Tubular.
M50587.	Felt Friction.

Serial No. and type must always be quoted when ordering spares.

G. B. BELL & HOWELL
MODEL 605 T VICEROY CAMERA

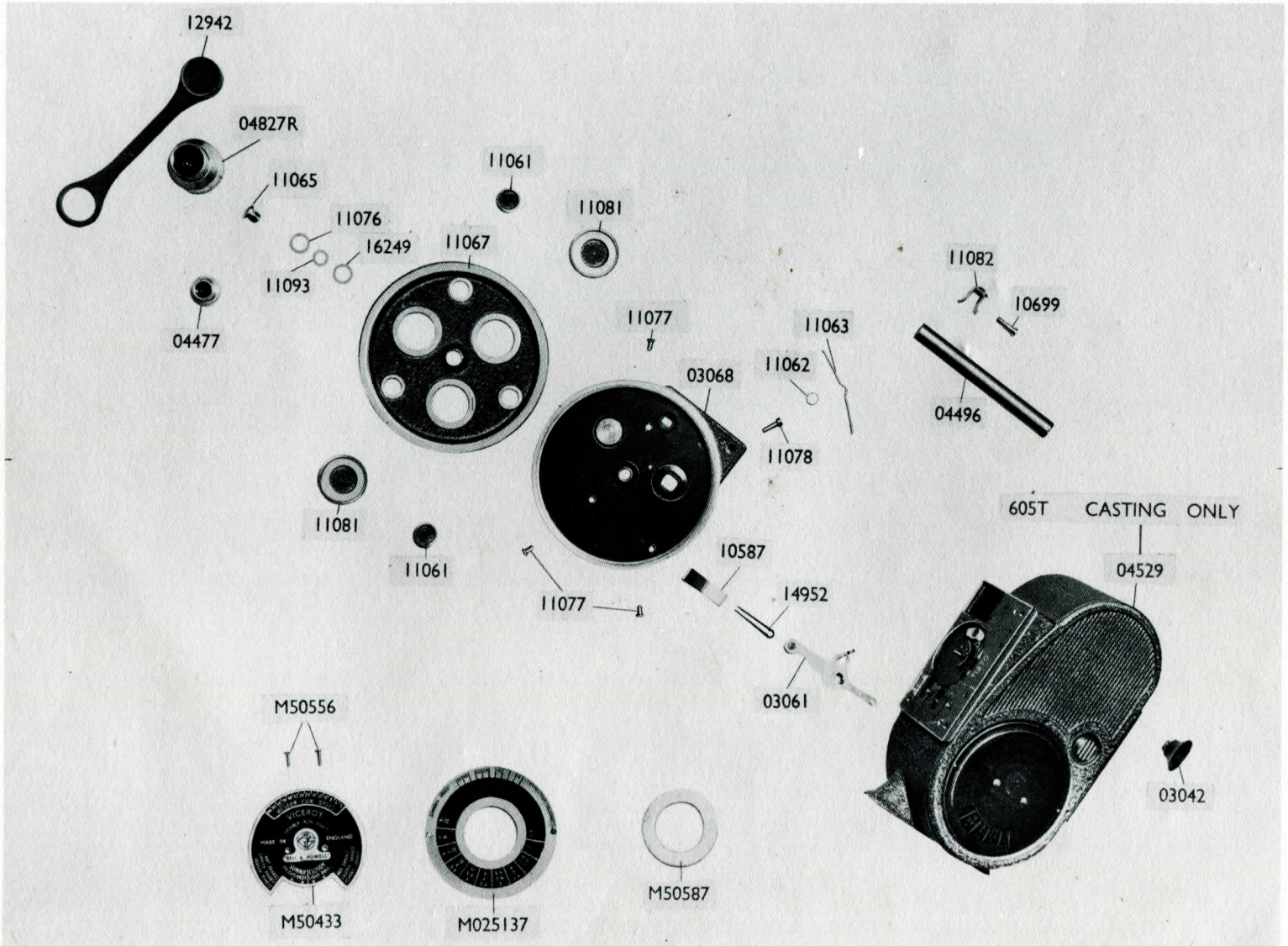

FIG. 4