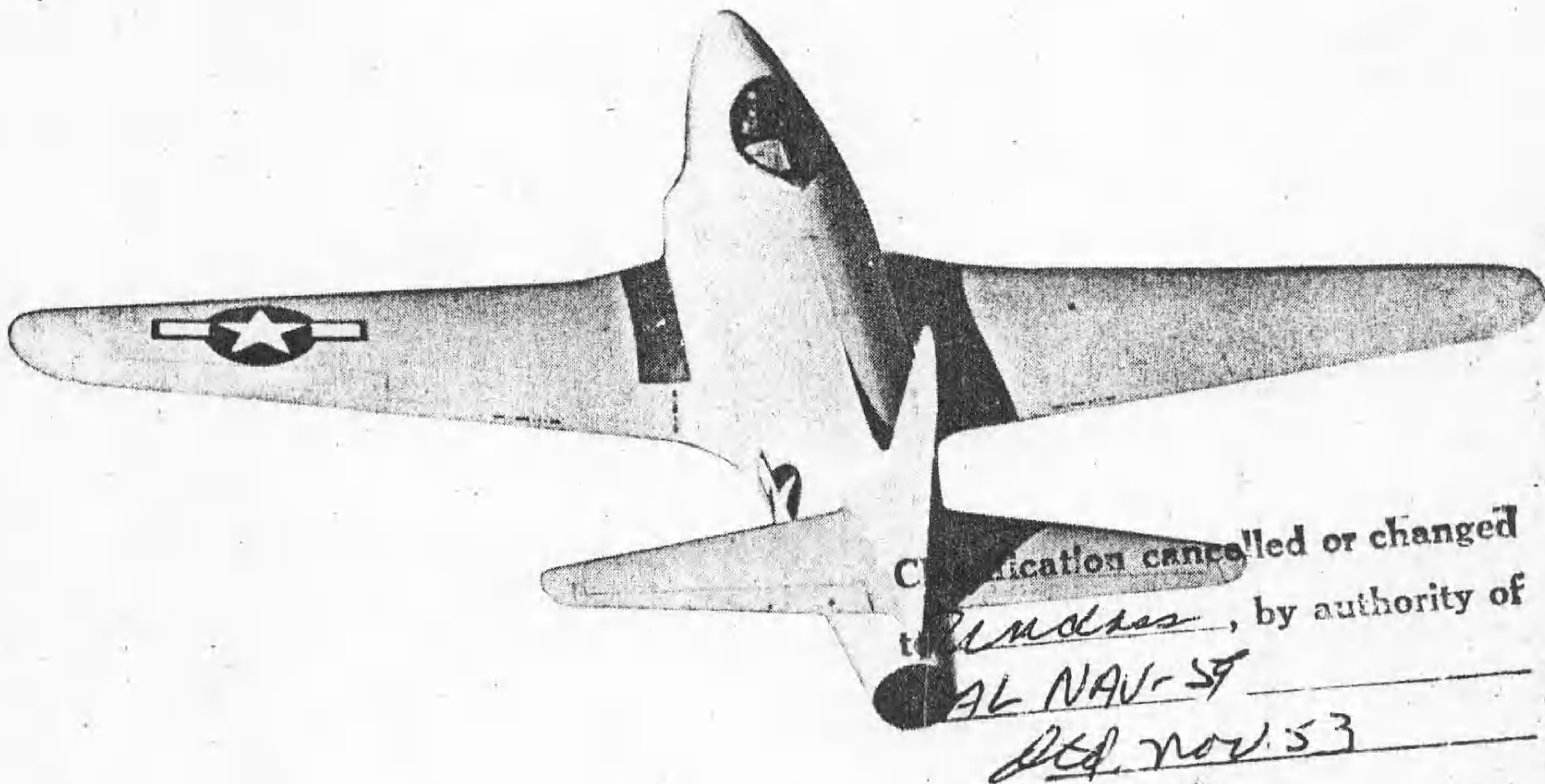


PILOT'S FLIGHT OPERATING INSTRUCTIONS FOR ARMY MODEL P-80A-1 AIRPLANE



This publication replaces AN 01-75FJ-1
dated 5 March 1945.

This publication contains specific instructions for pilots and should be
available for Transition Flying Training as contemplated in AAF Reg. 50-16.

Appendix I of this publication shall not be carried in aircraft on combat
missions or when there is a reasonable chance of its falling into the hands
of the enemy.

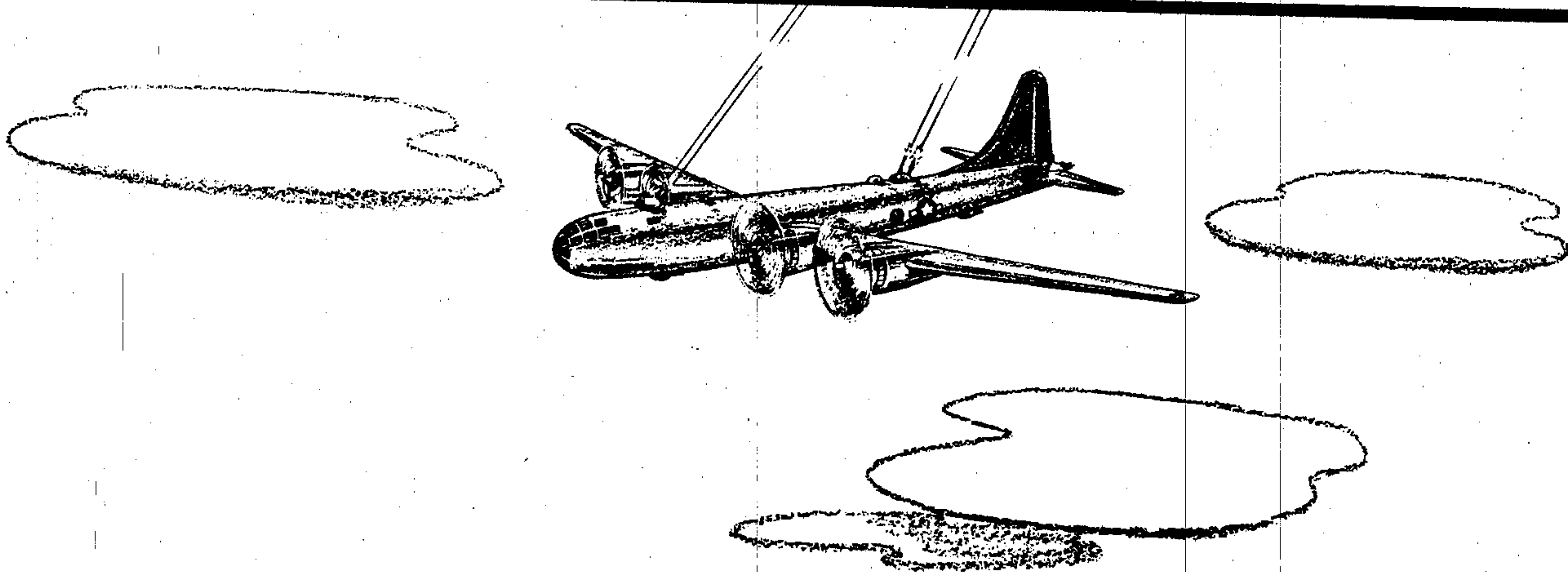
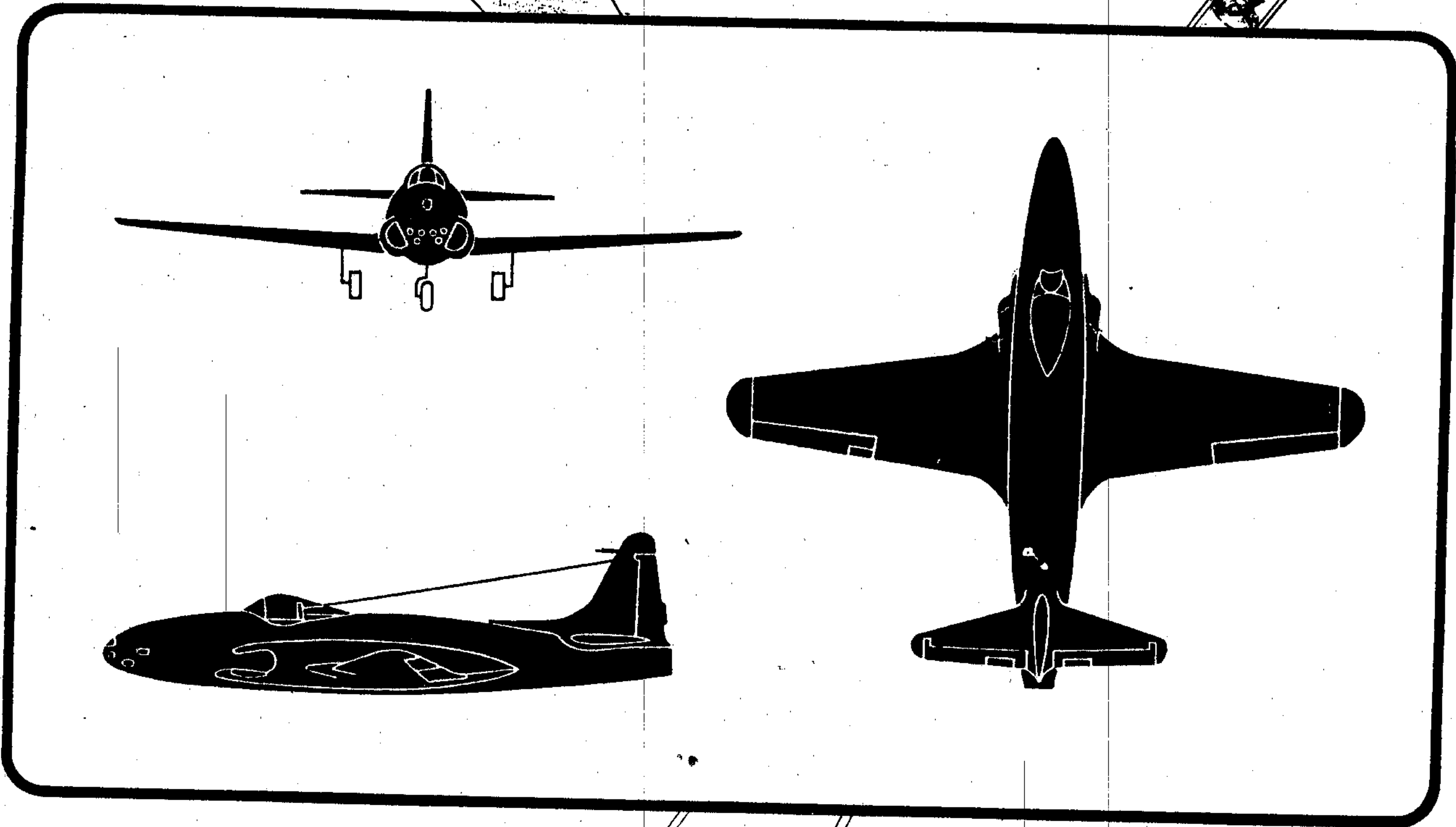
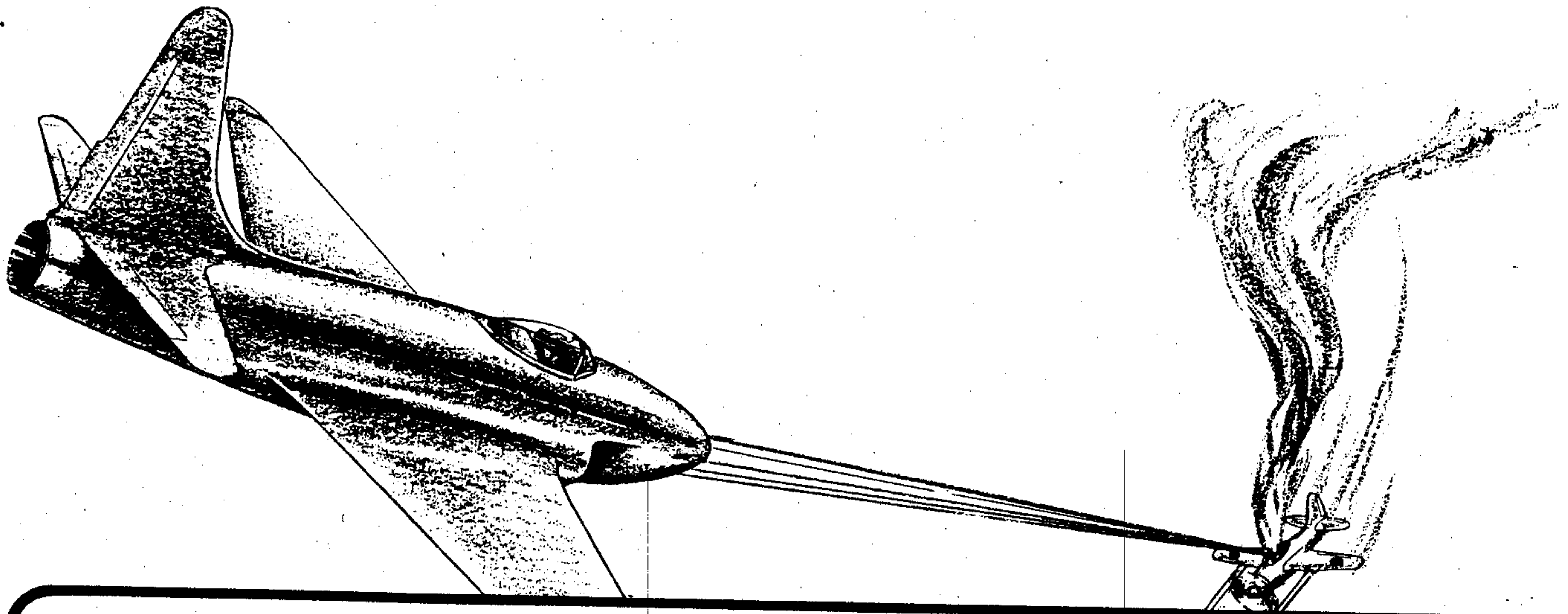
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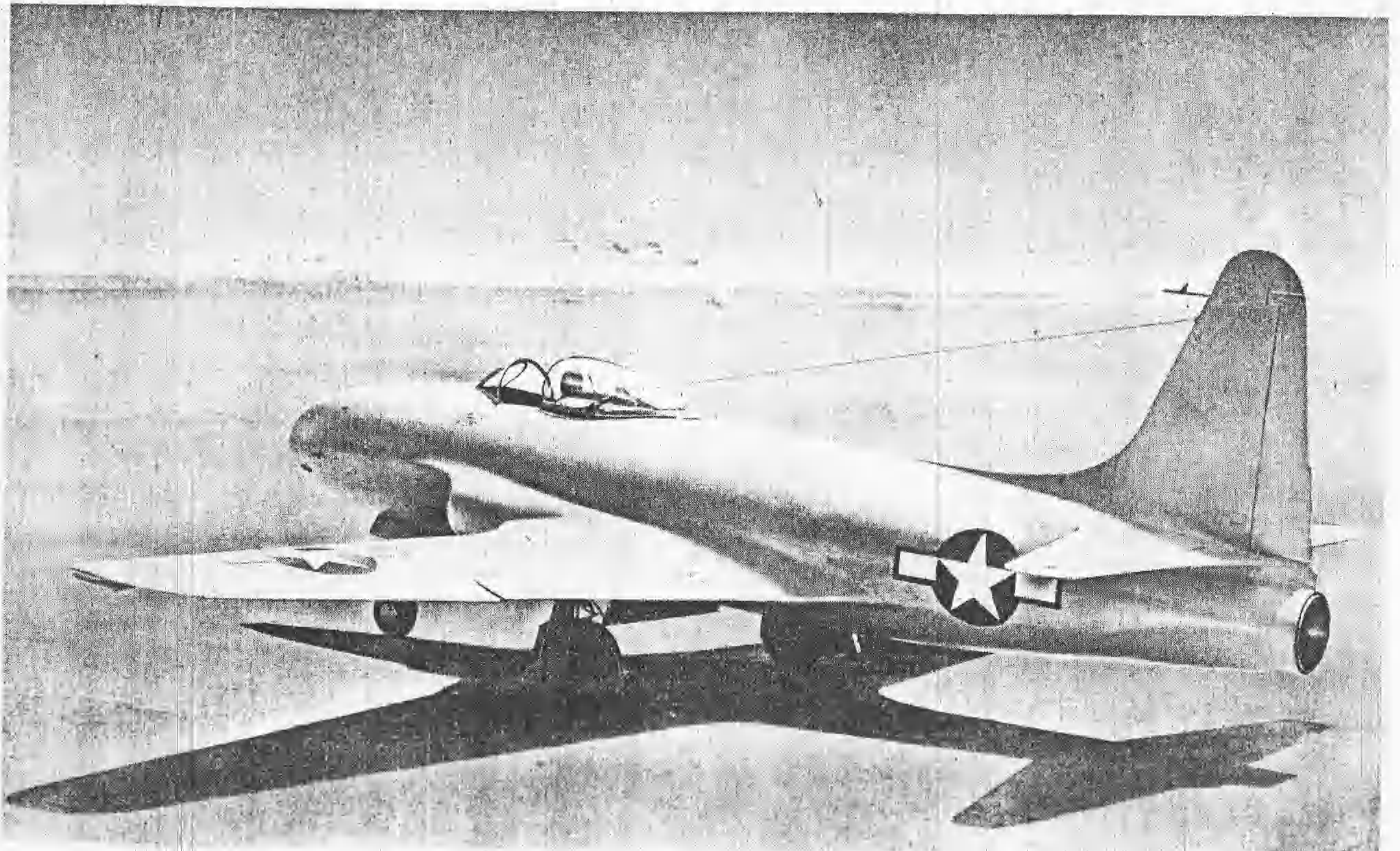
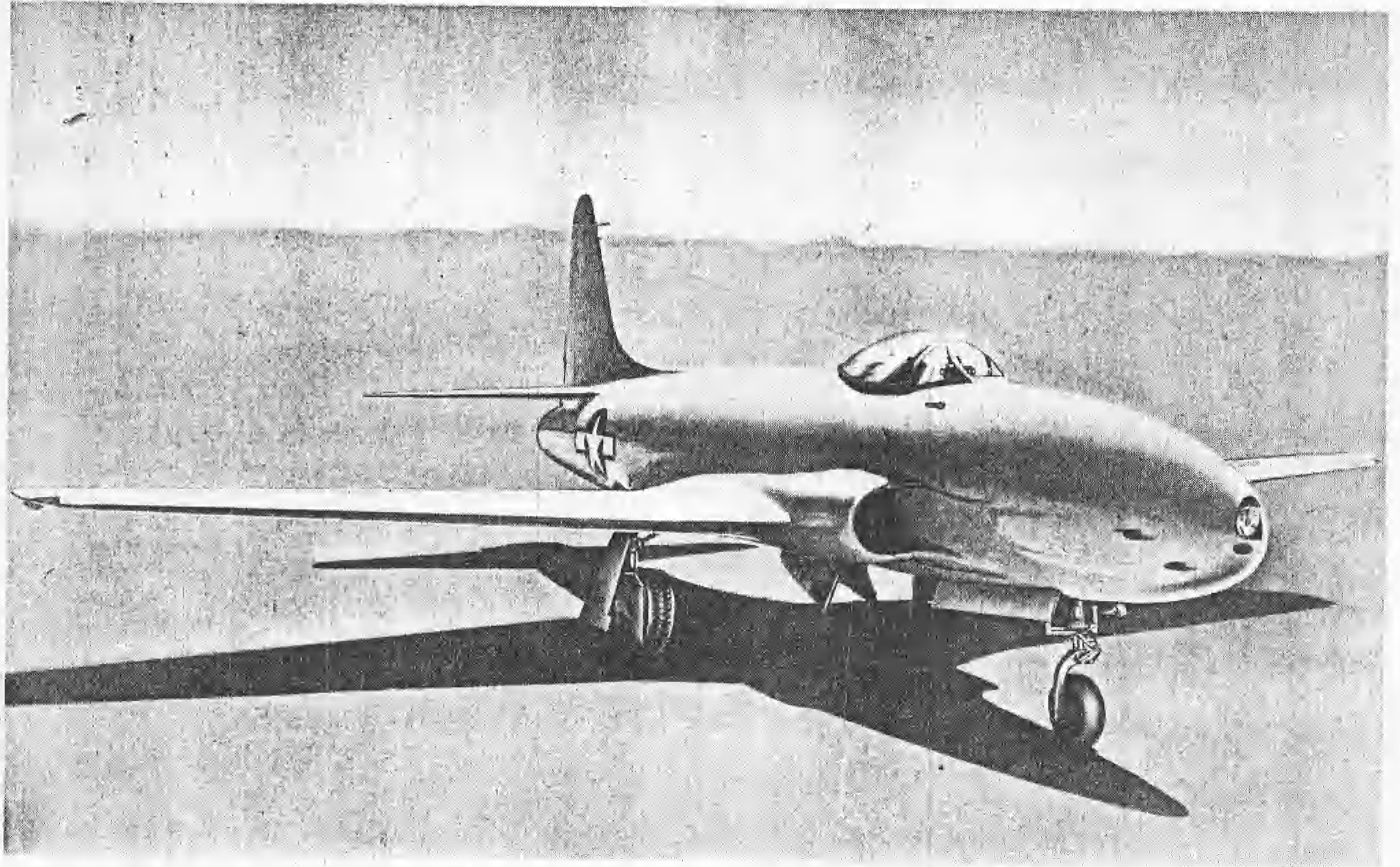
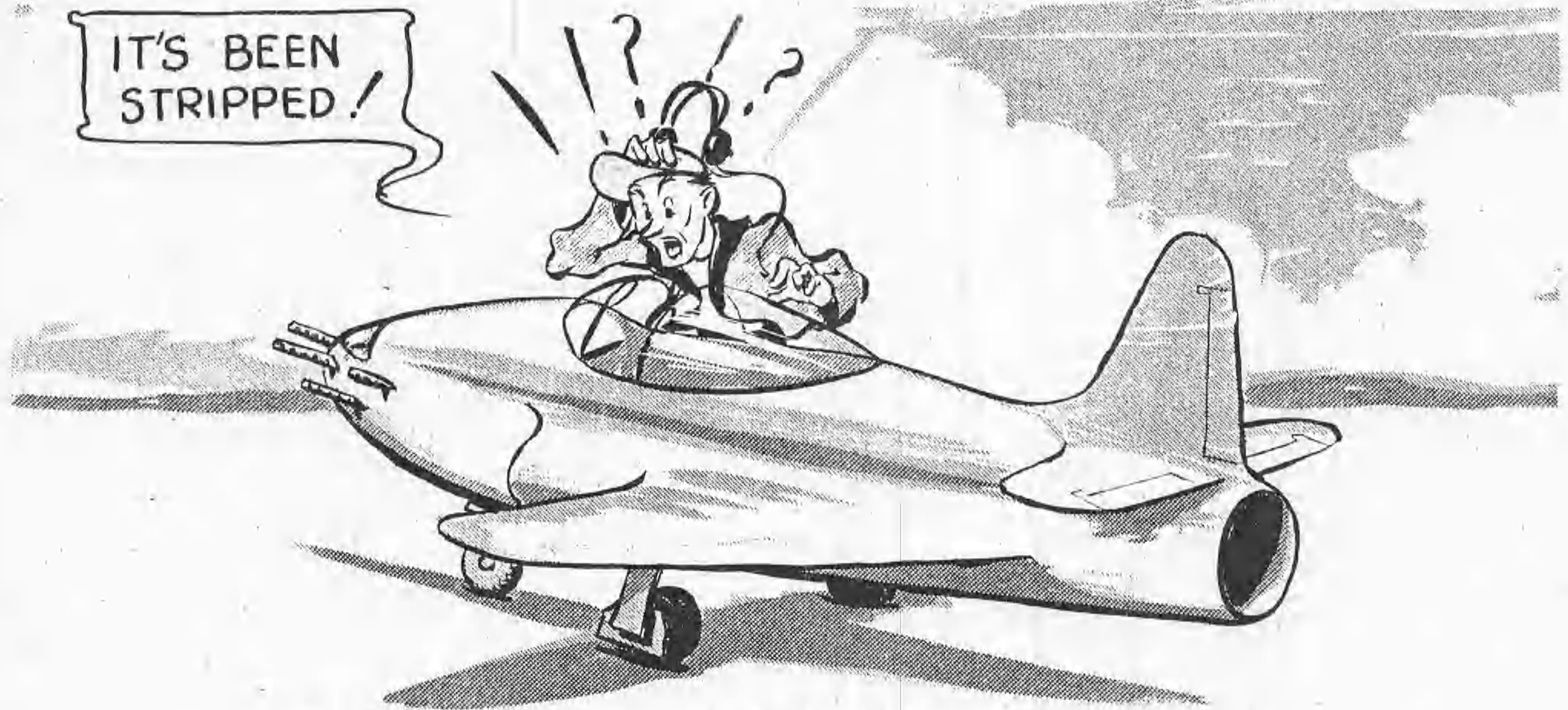


Figure 1 — The Airplane



Section I Description

1. GENERAL.

a. The P-80A is a single place, jet propelled fighter airplane.

b. The approximate overall dimensions of the airplane are as follows:

- (1) Wing span—39 ft.
- (2) Fuselage length—34 ft. 6 in.
- (3) Height (to top of rudder)—11 ft. 4 in.

c. The airplane gross weight runs between 8,000 pounds (empty) and 14,000 pounds (with max. fuel load).

d. The power plant, referred to hereafter as the engine, is a General Electric I-40 jet propulsion unit.

2. FLIGHT CONTROLS.

a. CONTROL SURFACES.

(1) The aileron forces are reduced by a hydraulic aileron booster unit. (See section I, paragraph 6.) The ailerons are spring loaded to the neutral position. Aileron, elevator, and rudder controls are conventional.

(2) The elevator forces are reduced by the elevator spring tab and the elevator servo tab.

(a) A spring in the elevator control system acts to assist holding the elevator in either the up or the down position. This arrangement gives a peculiar feel to the control on the ground. That is, considerable force

will be required to lift the elevator. After it has passed the 20° up position, the elevator will stay up of its own accord. The presence of the spring is not noticeable in flight.

(b) The spring loaded elevator tab acts to assist the pilot whenever the pull on the control stick reaches approximately 10 pounds. When the pull on the control stick reaches approximately 30 pounds, the spring tab is fully deflected.

(3) The rudder is spring loaded toward the neutral position.

b. CONTROL SURFACE LOCK.

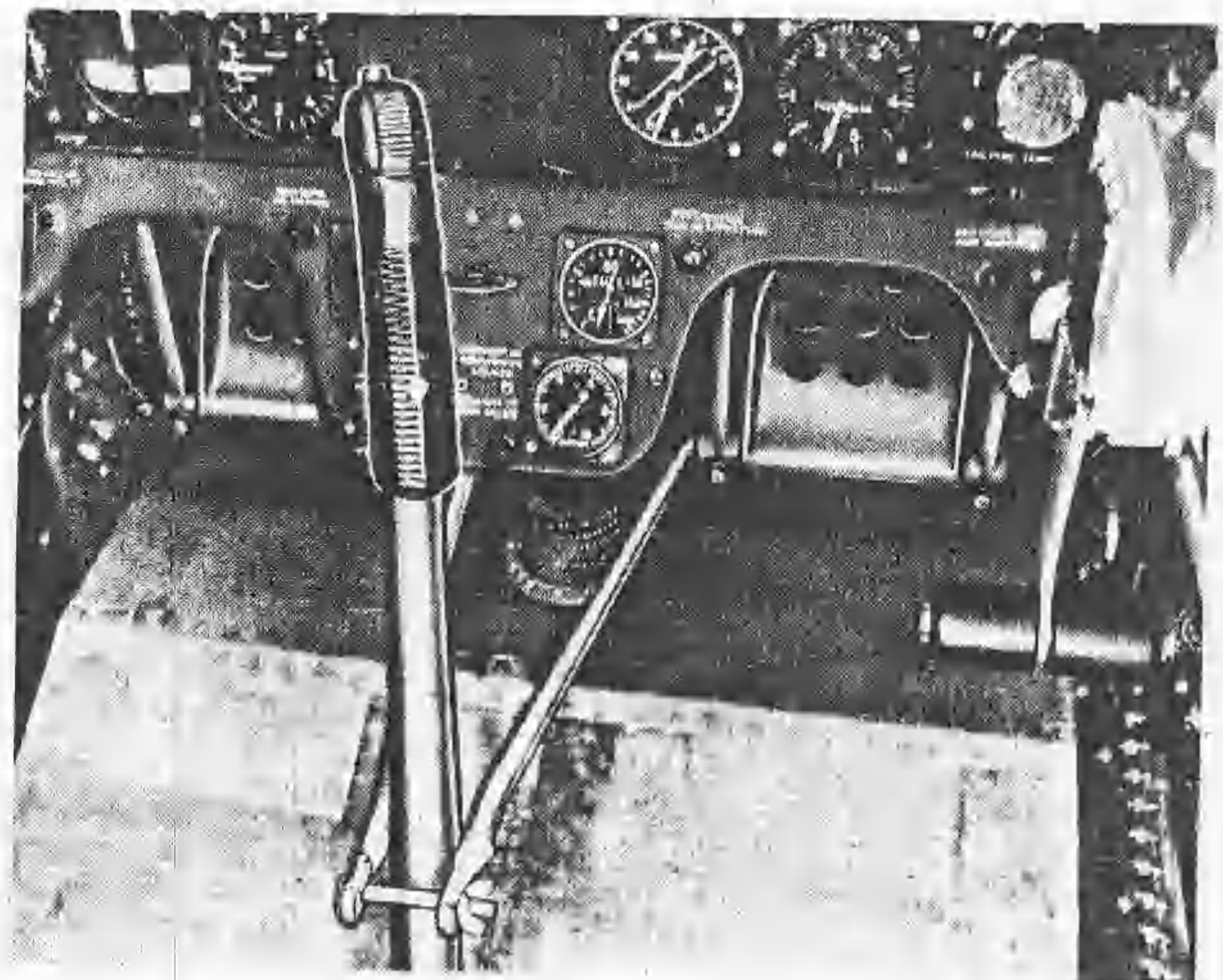


Figure 2 — Control Surface Lock

c. TRIM TABS.

(1) Trim tabs on the left aileron and on the elevator are electrically operated. The electric motors are controlled by switches in the cockpit.

(a) Aileron tab switch (figure 6-2).

(b) Elevator tab switch (figure 7-19).

(2) An indicator light (figure 7-29) glows when the elevator tabs are in the neutral position.

(3) The rudder tab is not controllable from the cockpit.

CAUTION

The tab motors and the wing flap motors coast for about 3 seconds after the switches are turned off. Do not reverse these motors without allowing time for them to stop rotating.

d. WING FLAPS.

(1) The wing flaps are operated by two electric motors, one for each flap. The wing flap position indicator (figure 6-13) shows the position of the flaps at all times.

(2) The left and right wing flaps are interconnected so that either motor may operate both flaps if the other motor should fail. There is no emergency wing flap extension system on this airplane.



KEEP FOREIGN OBJECTS OUT OF INTAKE DUCTS
3. LANDING GEAR CONTROLS.

a. Normally, the landing gear is retracted or extended by raising or lowering the landing gear control lever (figure 6-26).

b. In an emergency, it is possible to pump the landing gear down by using the hand pump (figure 8-18) with the landing gear emergency selector (figure 8-19) in the emergency position and the landing gear control (figure 6-26) down.

c. LANDING GEAR POSITION INDICATOR.

(1) Two lights (figure 7-26) indicate the landing gear position. The green light is on whenever the landing gear is down and locked. The red light comes on, and a warning horn sounds if the throttle is closed when the landing gear is not down and locked. The horn may be silenced by pushing the switch (figure 6-15). The switch is automatically reset when the throttle is opened.

4. BRAKE CONTROLS.

a. The brakes are operated by conventional toe brake pedals. A parking brake (figure 7-25) locks the brakes for extended periods. There are no emergency braking provisions on this airplane.

5. HYDRAULIC SYSTEM CONTROLS.

(See figure 3.)

a. The electrically operated hydraulic pump motor runs on power from the engine generator. The hydraulic pump is in operation whenever the generator is on; it cannot be operated on power from the airplane battery.

b. Hydraulic power is used to operate the aileron booster, the landing gear and the dive flaps.

6. AILERON BOOSTER CONTROLS.

a. The aileron booster is a source of power which assists the pilot in the operation of the ailerons. The pilot supplies approximately 1/15 of the force required and the booster supplies the rest. This system does not destroy the "feel" of the aileron control as it supplies only a fixed portion of the total force required. The remaining force applied by the pilot changes normally with changes in speed and rate of roll.

b. The aileron booster shut-off valve is automatic and operates whenever the system pressure drops below approximately 250 lb/sq in. The manual shut-off valve cannot be operated from the cockpit.

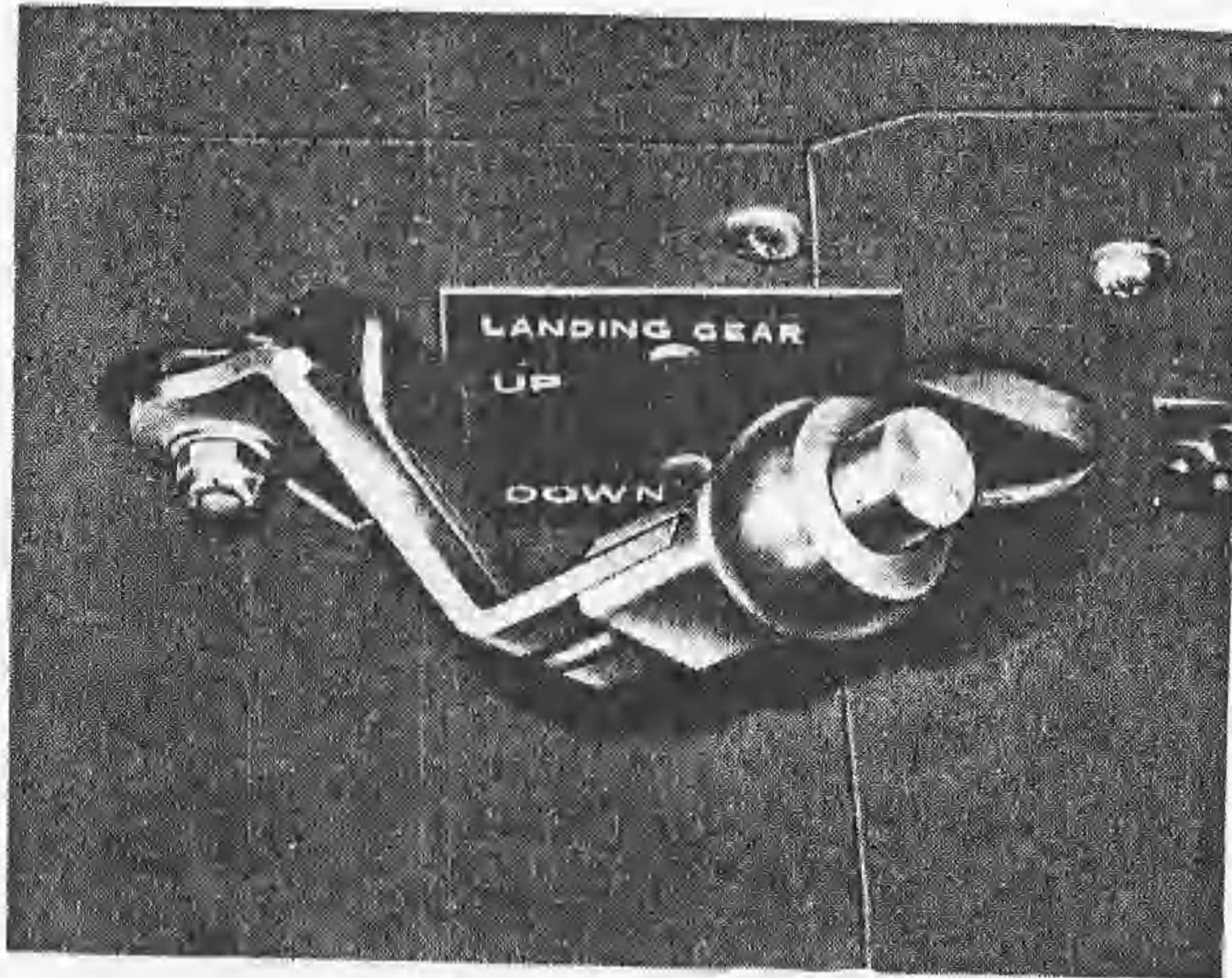
c. The aileron booster may be shut off in flight by turning the generator switch off and thereby stopping the hydraulic pump motor.

7. DIVE FLAP CONTROLS.

(If installed)

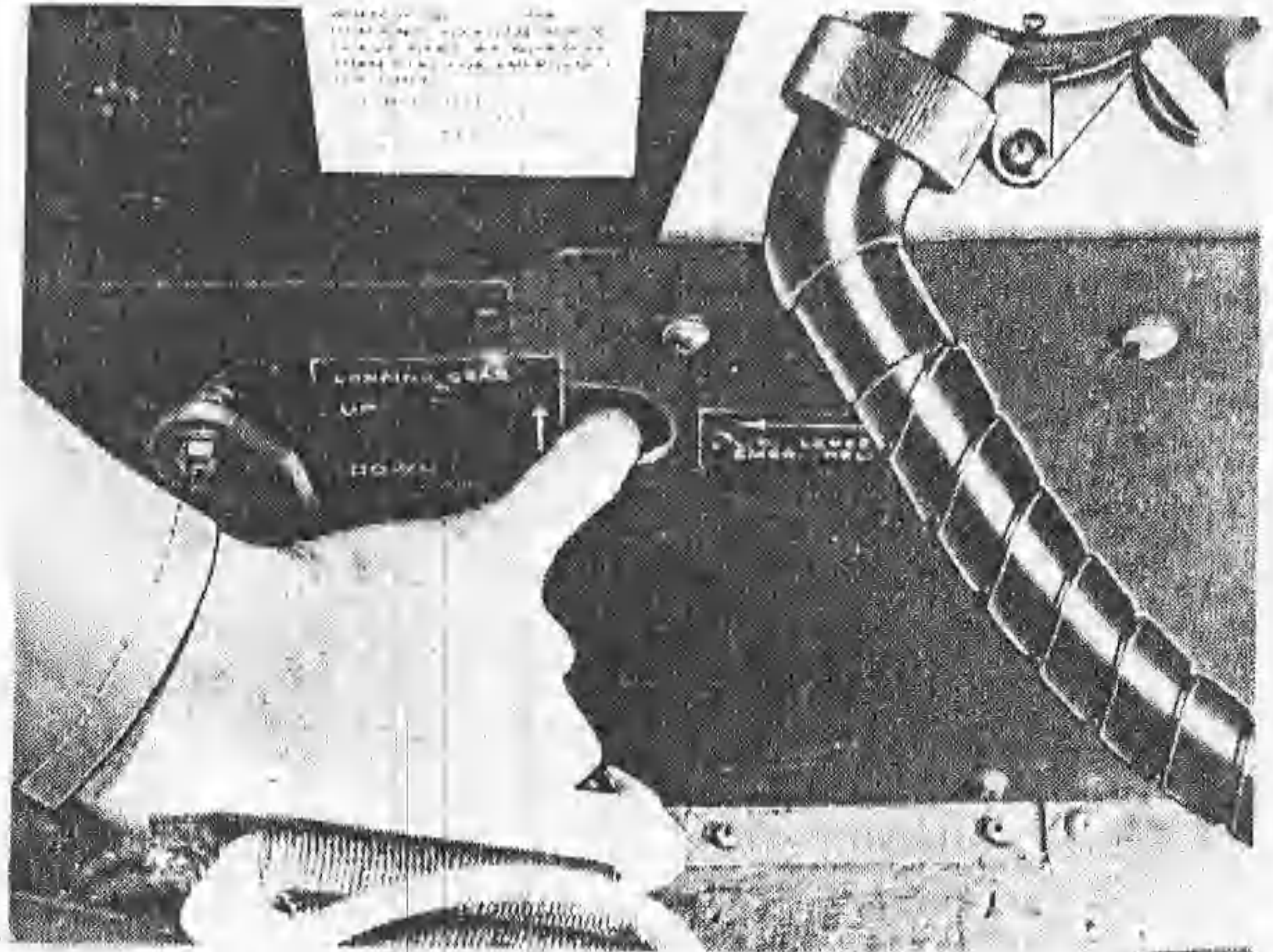
a. The dive flaps are controlled by a switch (figure 6-11), which operates an electrically actuated hydraulic valve. It is not possible to stop the dive flaps in any intermediate position; they must be either full up or full down.

NORMAL OPERATION

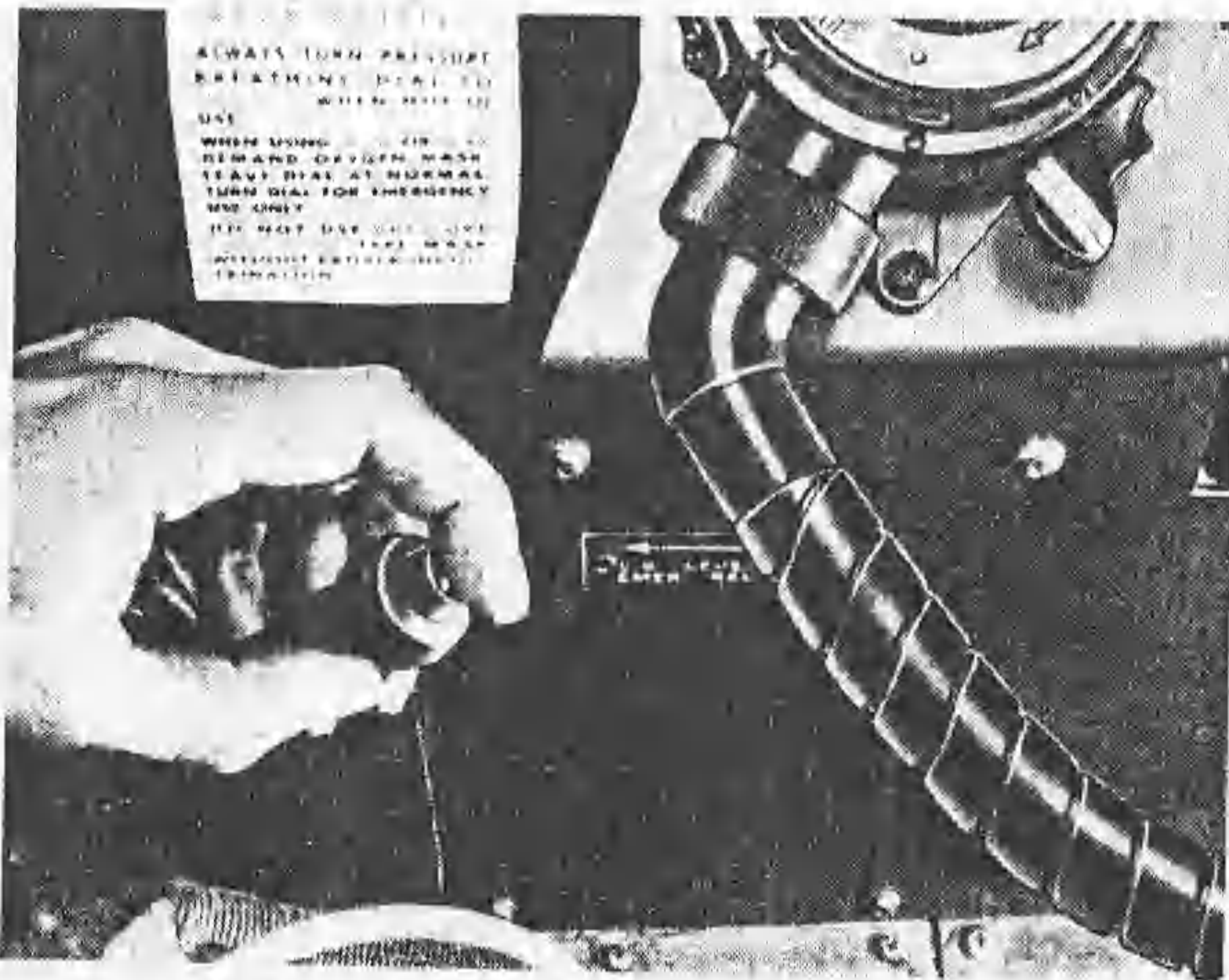


Landing gear control.

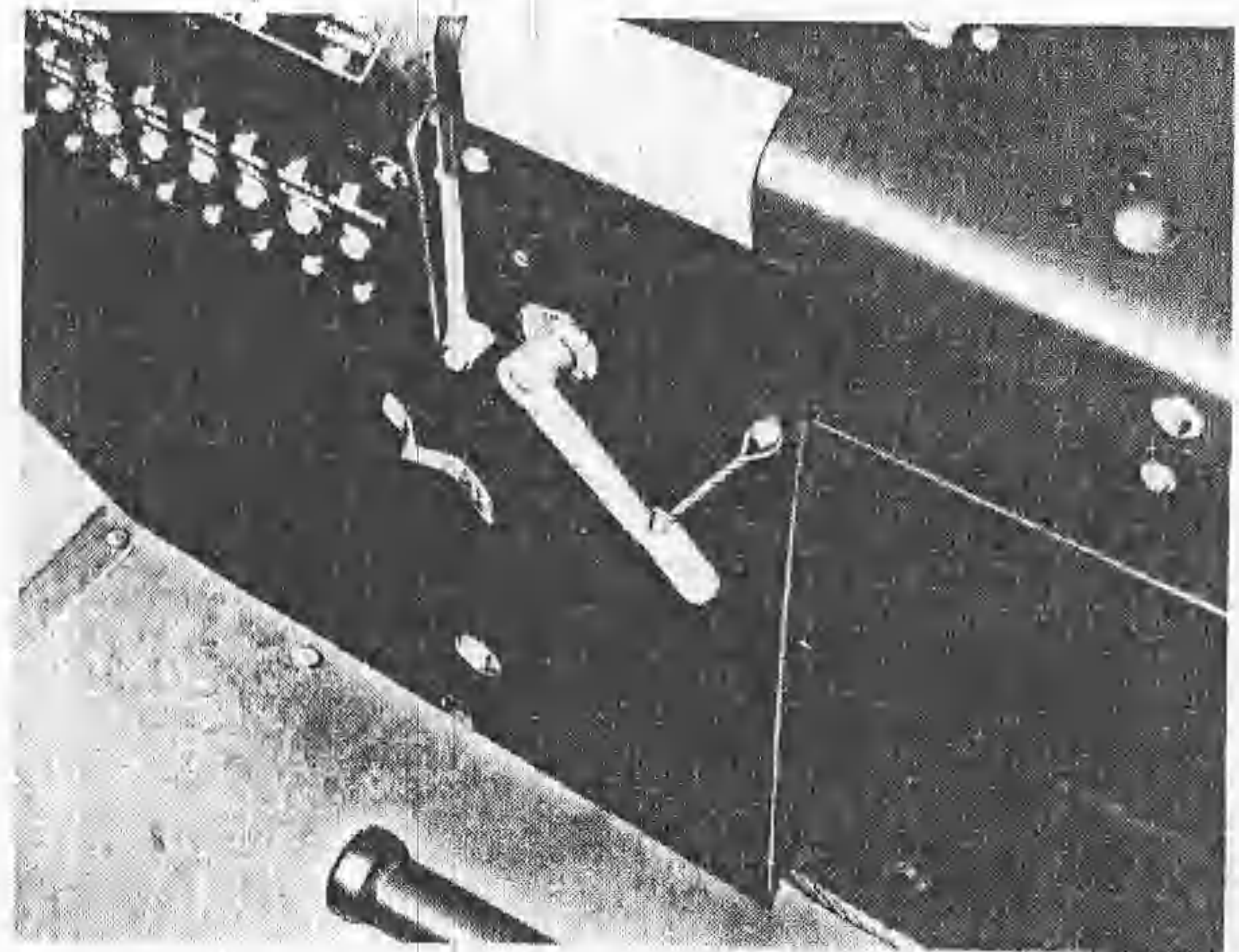
EMERGENCY OPERATION



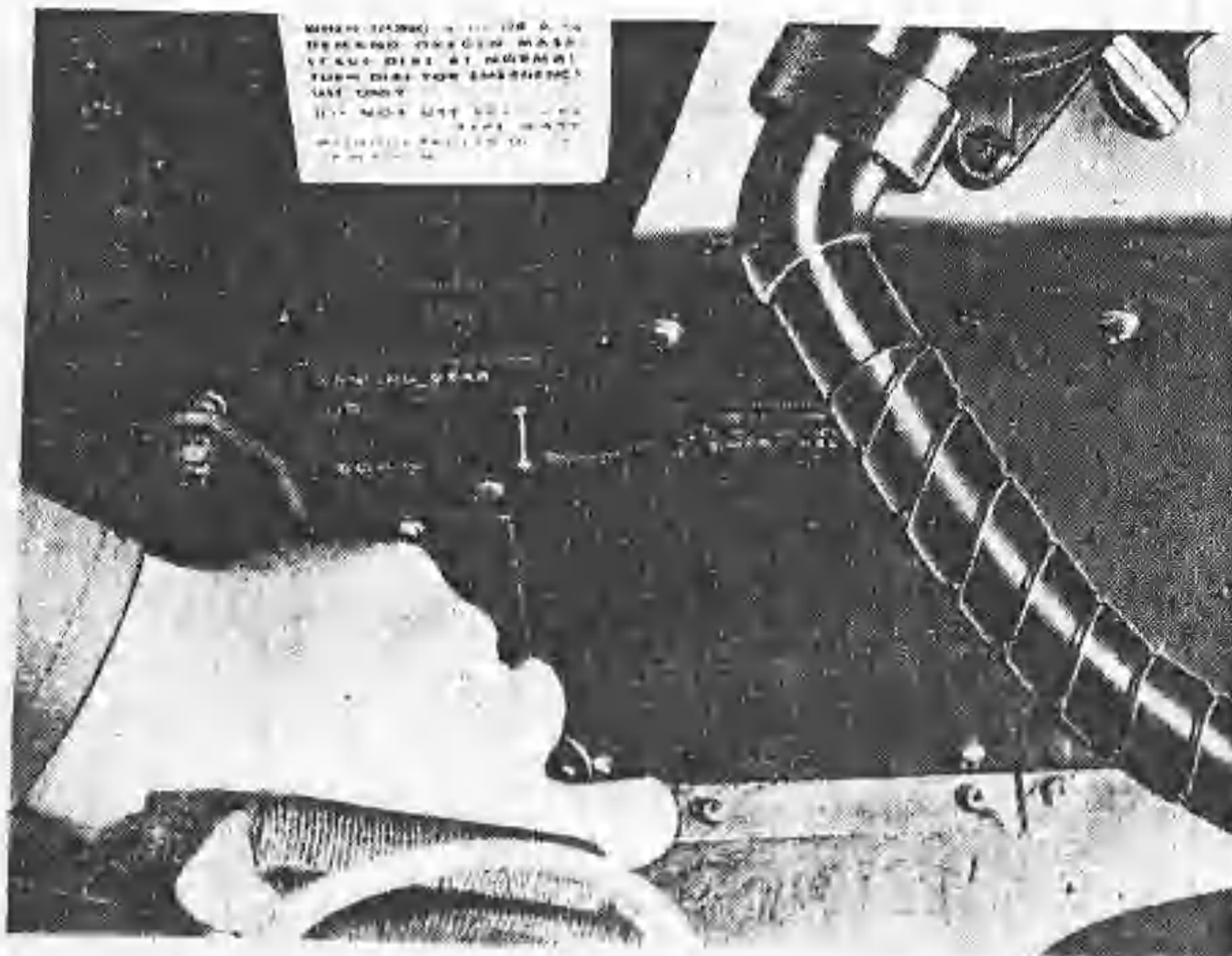
If the landing gear control will not move out of the down position, push the control lock release aft and then move the control.



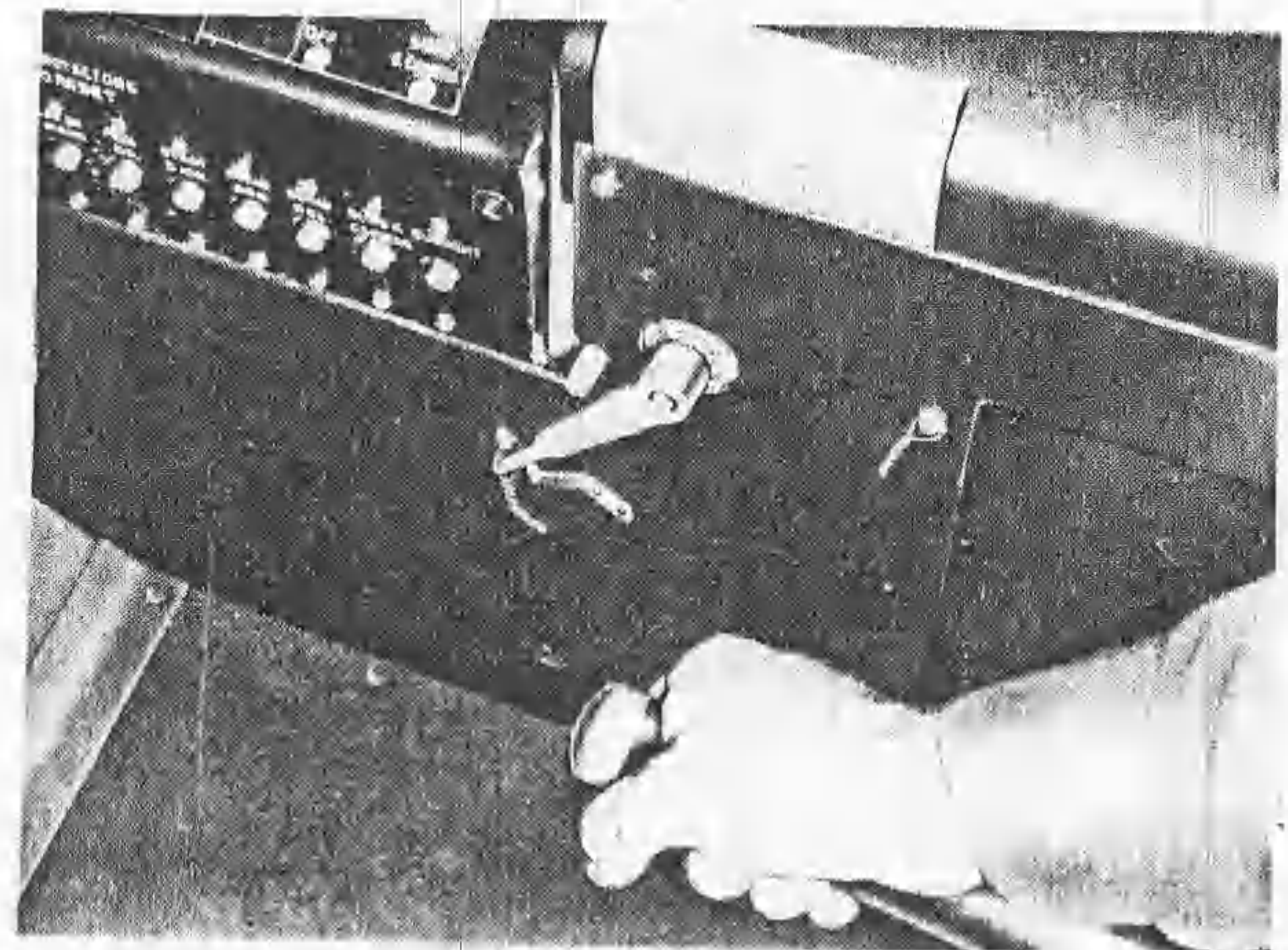
Control position for landing gear up.



Break safety wire on the emergency bypass valve control and push the control to emergency.



Control position for landing gear down.



Operate the hand pump until the gear is down.

Figure 3 — Hydraulic System Controls Diagram

8. ELECTRICAL CONTROLS.

a. GENERAL.

(1) The electrical system is in operation whenever the battery switch (figure 8-3) and the generator switch (figure 8-4) are in the on position.

b. CIRCUIT BREAKERS.

(1) Each electrical circuit in the airplane is protected by a thermal circuit breaker (figure 6-10). The circuit breakers may be reset by pushing the button for the circuit that has failed. The generator and hydraulic pump circuit breaker is not accessible to the pilot in flight.

c. EXTERNAL POWER SUPPLY CONNECTION.

(1) The external power supply plugs into a socket in the aft end of the right wing fuselage fillet.

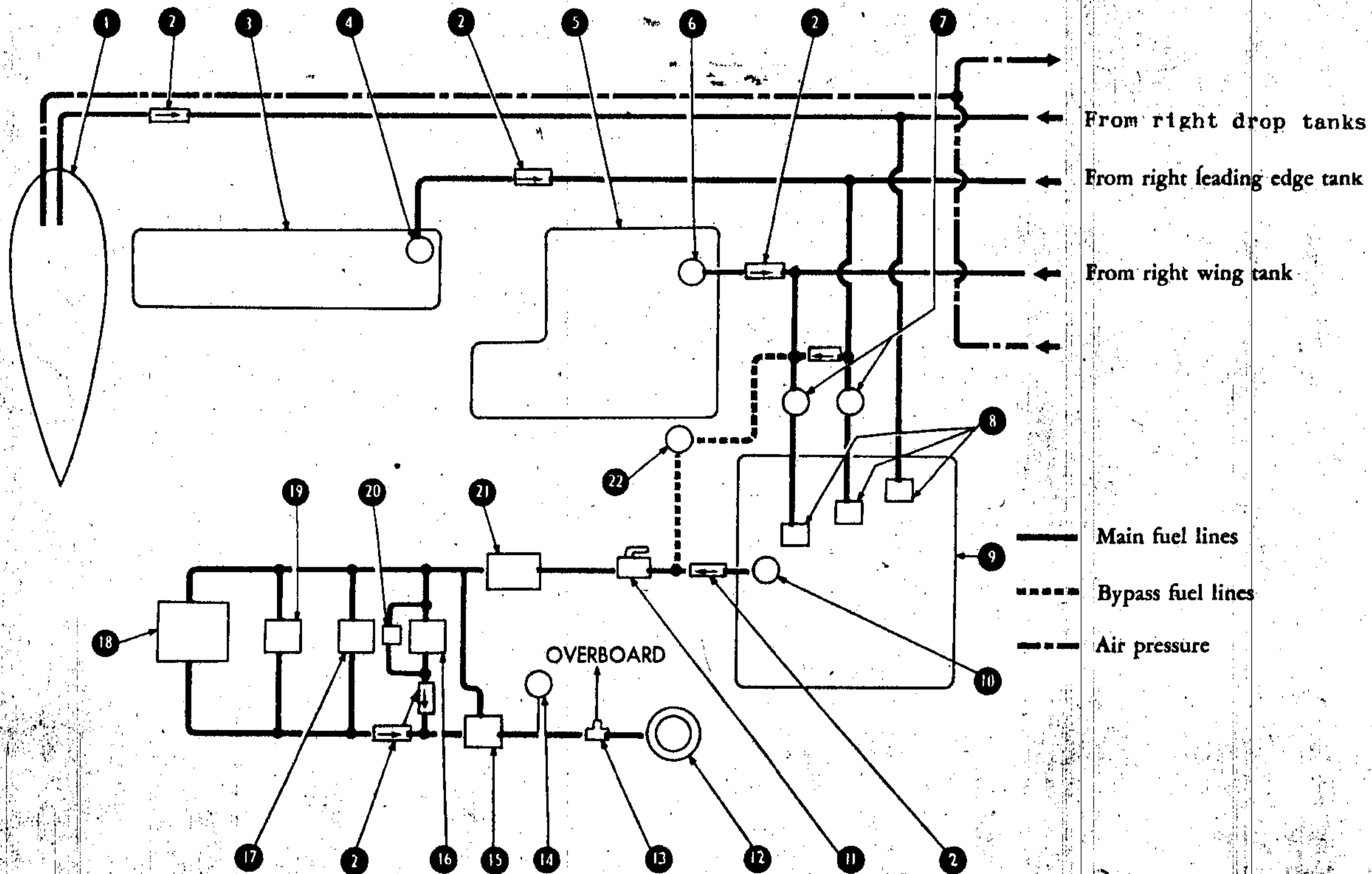
9. FUEL SYSTEM CONTROLS.

(See figure 5.)

a. Under normal conditions, all the fuel is transferred to the main tank before being fed to the engine. This transfer is accomplished first from the droppable tanks, next, from the leading edge tanks, and last, from the wing tanks. All the transferring operation is automatic if the fuel tank selector switches (figure 6-18; 6-19; 6-21; 6-22) are properly set.

b. FUEL TANK SELECTOR SWITCHES.

(1) DROPPABLE TANKS. (See figure 6-22.)— This switch opens an electrically operated valve admitting air pressure from the engine into the droppable tanks. This pressure forces fuel through a float valve, into the main tank. The main tank is kept full until the droppable tanks are empty.



1. Droppable tank (capacity 165 U.S. gal.) (137 Imperial gal.)
2. Check valve
3. Leading edge tank (capacity 48 U.S. gal. in each wing) (40 Imperial gal.) (With self-sealing tanks installed)
4. Leading edge tank transfer pump

5. Wing tank (capacity 65 U.S. gal. in each wing) (54 Imperial gal.)
6. Wing tank transfer pump
7. Bypass valves
8. Float valves
9. Fuselage tank (capacity 207 U.S. gal.) (172 Imperial gal.)
10. Fuselage tank booster pump
11. Manual shut-off valve

12. Burner ring
13. Drip valve
14. Fuel pressure gage
15. Engine control valve (throttle)
16. Starting fuel pump
17. Governor
18. Engine driven fuel pump
19. Barometric control
20. Relief valve
21. Filter
22. Bypass valve

Figure 4 — Fuel Flow Diagram

(2) LEADING EDGE TANKS. (See figure 6-21.) —This switch operates an electric transfer pump in each group of leading edge tanks. These pumps force fuel through another float valve, located about one inch below the droppable tank float valve, in the main tank. The fuel level in the main tank is maintained at the level of the leading edge tank float until these tanks are empty.

(3) WING TANKS. (See figure 6-19.) — This switch operates an electric transfer pump in each group of wing tanks. These pumps feed fuel to the main tank through another float valve located about one inch below the leading edge tank float valve. The fuel in the main tank is maintained at this level until the wing tanks are empty.

(4) MAIN TANK. (See figure 6-18.)—This is a two position, momentary contact switch. It serves the following purposes:

(a) When held in the up position for two or three seconds, this switch starts the fuel booster pump, located in the main fuel tank, and at the same time, sets the main tank bypass valves for normal operation.

(b) When held in the down position for two or three seconds, this switch shuts off the fuel booster pump and sets the main tank bypass valves for emergency operation.

(c) The indicator light (figure 6-17) above the main tank selector switch is on whenever the booster pump is on.

c. FUEL TANK INDICATOR LIGHTS.

(1) Indicator lights (figure 6-24) for wing, leading edge, and droppable tanks operate from pressure switches within the fuel lines from each group of tanks. These lights come on to indicate that the tanks are empty.

(a) The pilot should turn the tank selector switch off soon after the indicator light comes on. This will save the booster pump motors and, in the case of droppable tanks, will prevent robbing the engine of air.

d. FUEL QUANTITY INDICATOR.—The fuel gage (figure 7-23) indicates the quantity of fuel in the main tank only. The low level warning light (figure 7-22) comes on when there are approximately 100 U.S. gallons (83 Imperial gallons) remaining in the main tank.

10. THROTTLE CONTROL.

a. The throttle (figure 6-9) is the only power control on this airplane. The throttle regulates the fuel pressure to the burner fuel jets of the engine, and the resulting fuel pressure determines the rpm of the engine.

b. In the shut off position, the throttle completely stops the flow of fuel to the engine.

c. To obtain constant rpm engine operation at all altitudes, the burner ring fuel pressure must be decreased as the altitude is increased. A barometric control is installed in the airplane to accomplish this reduction in fuel pressure automatically, however this unit has not yet been perfected and action on the part of the pilot is occasionally required.

(1) In unusual cases, when engine rpm cannot be reduced sufficiently at altitude, it will be necessary to open the *altitude idle valve* which is located on the cockpit floor. This action will reduce the fuel pressure obtained by any given throttle setting and thus will allow the engine rpm to be regulated as desired.

Note

When the airplanes are delivered from the factory, the altitude idle valve is installed but is not operative. The valve may be connected to operate as above if desired.

(2) The altitude idle valve must be closed at low altitudes. Failure to observe this precaution will result in low fuel pressure, and probable engine failure when the throttle is set to idle. Note section II, paragraph 1, a, (4).

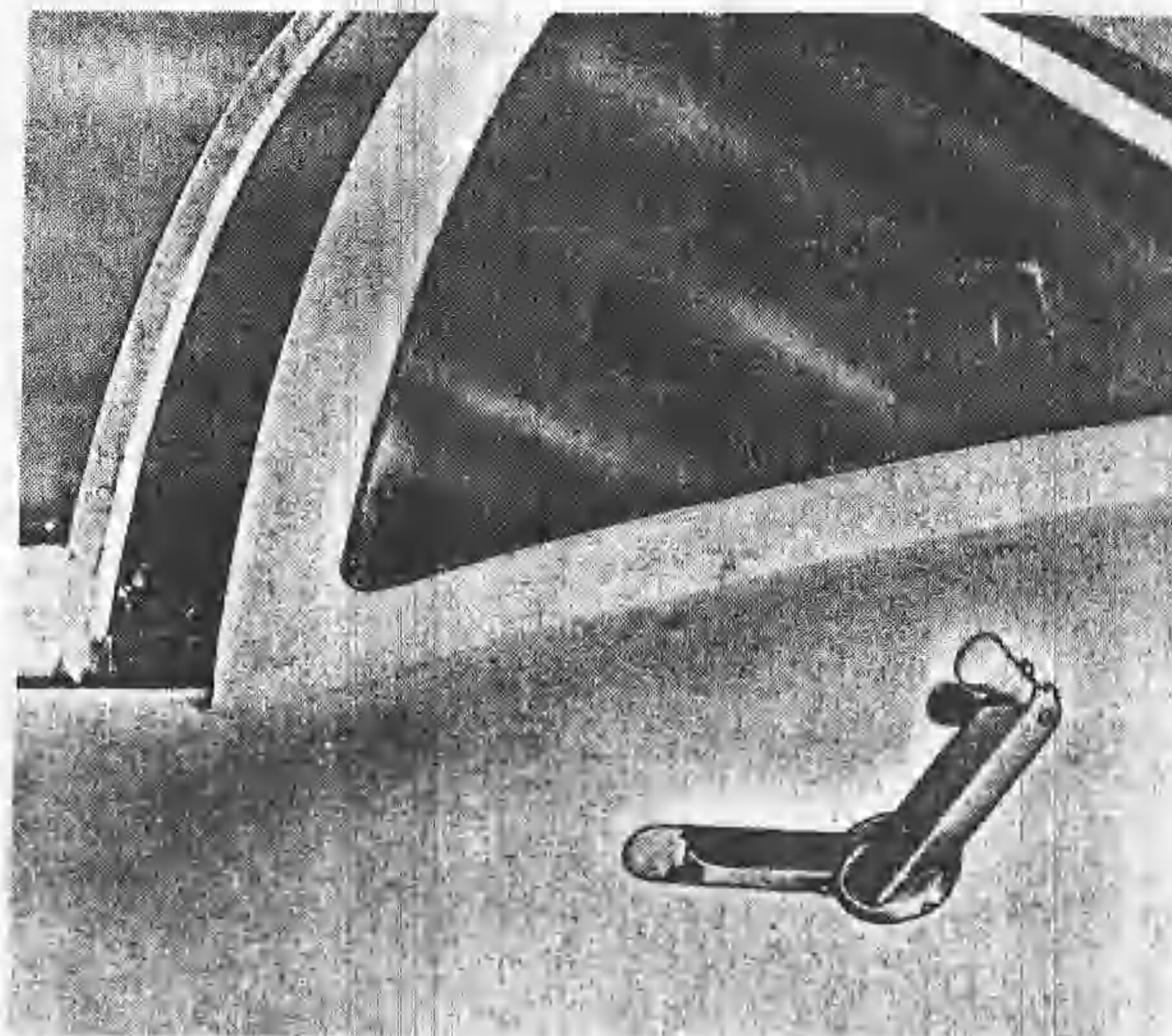
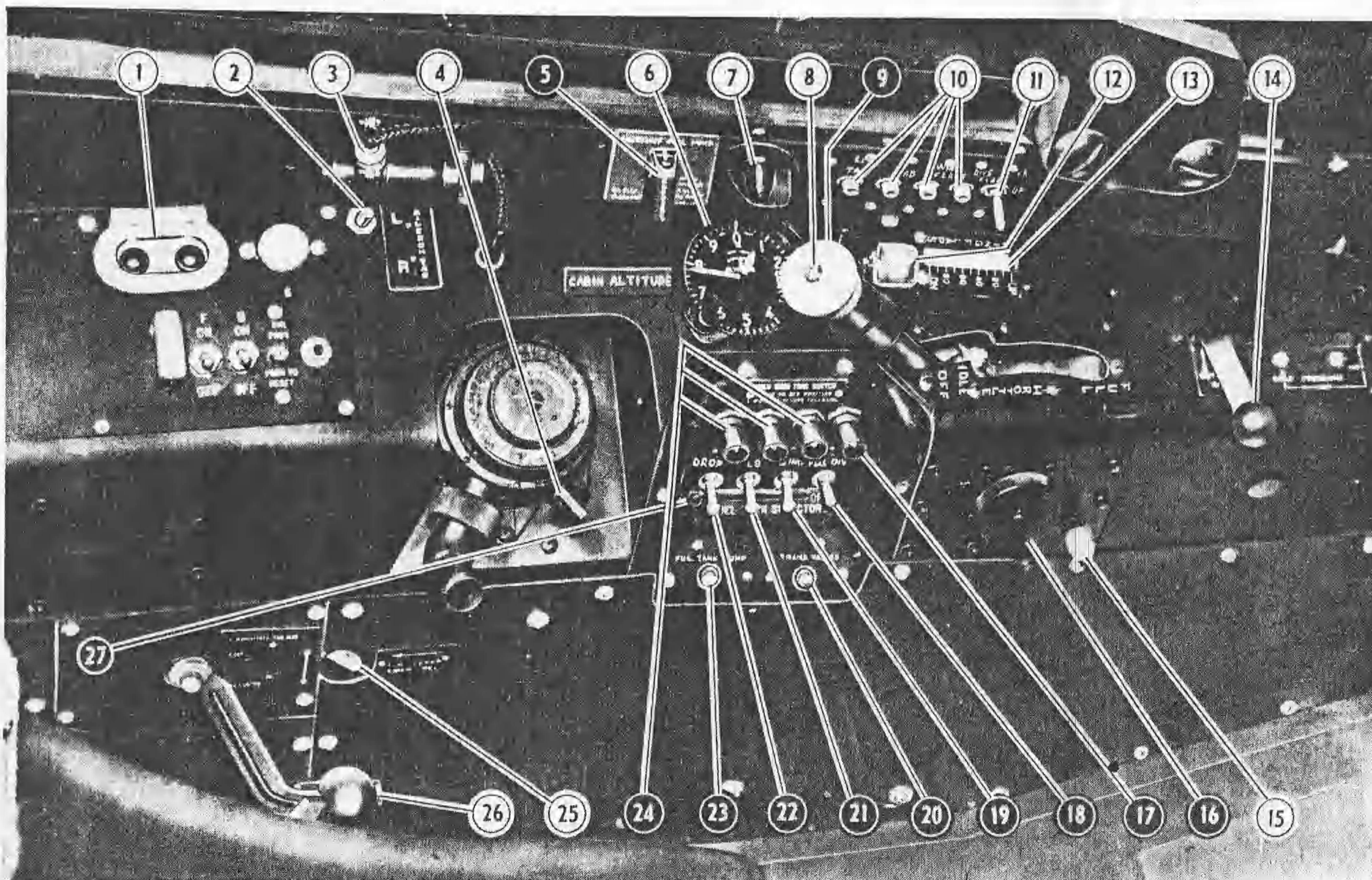


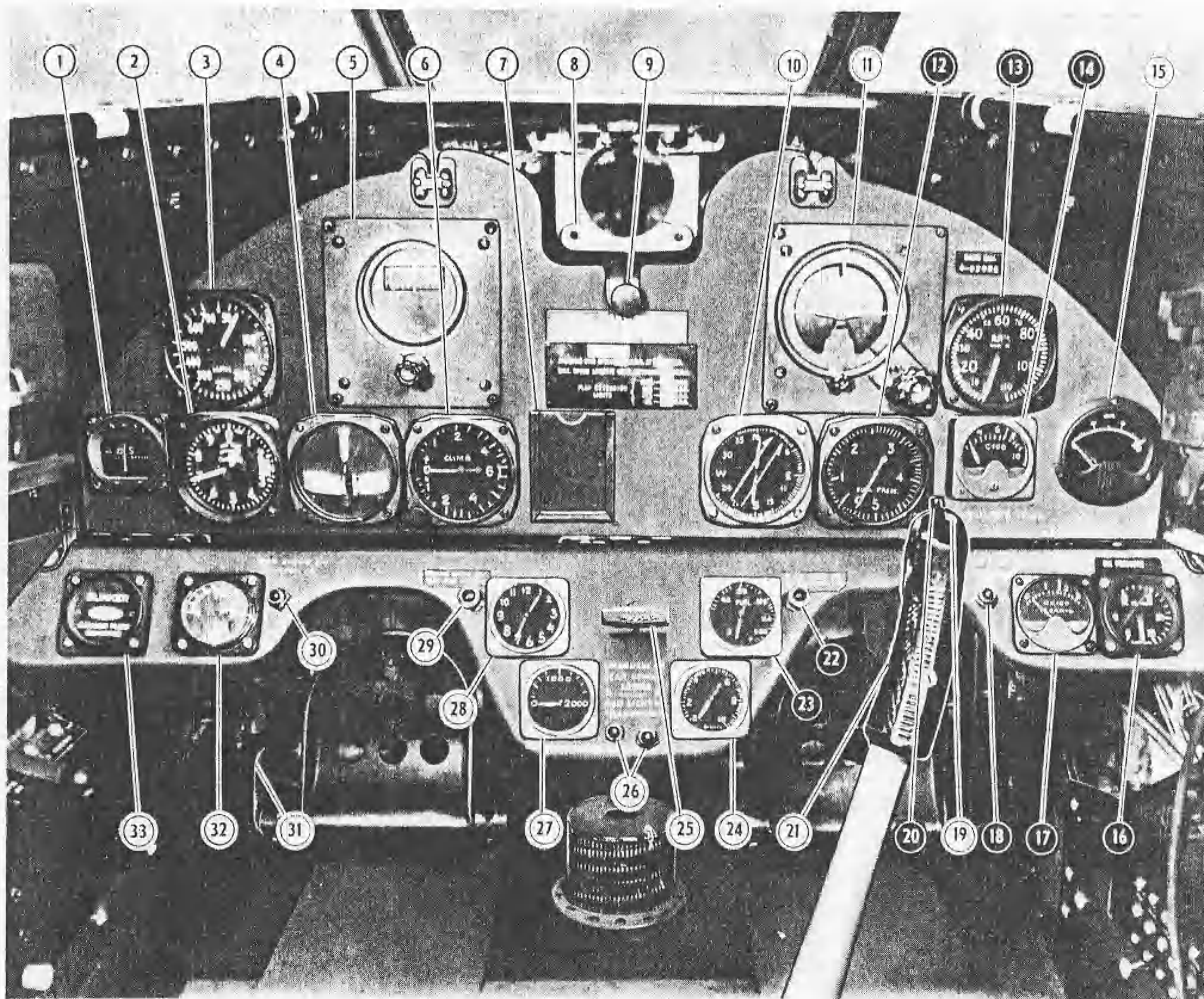
Figure 5 — External Canopy Crank



- | | |
|--|---|
| 1. SCR 695 Radio control panel | 15. Throttle warning horn shut-off switch |
| 2. Aileron tab switch | 16. Throttle friction control |
| 3. Fluorescent light | 17. Main tank booster pump indicator light |
| 4. Oxygen diluter lever | 18. Main tank switch |
| 5. Emergency fuel pump switch | 19. Wing tank selector switch |
| 6. Cabin altimeter | 20. Emergency bypass valve circuit breaker re-set button |
| 7. Fluorescent light switch | 21. Leading edge tank selector switch |
| 8. Microphone button | 22. Droppable tank selector switch |
| 9. Throttle | 23. Main tank booster pump circuit breaker re-set buttons |
| 10. Circuit breaker re-set buttons | 24. Fuel tank indicator lights |
| 11. Dive flap switch | 25. Landing gear lever down lock release |
| 12. Wing flap switch | 26. Landing gear lever |
| 13. Wing flap position indicator | 27. Fuel tank selector bar |
| 14. Cabin pressurization-ventilation control | |

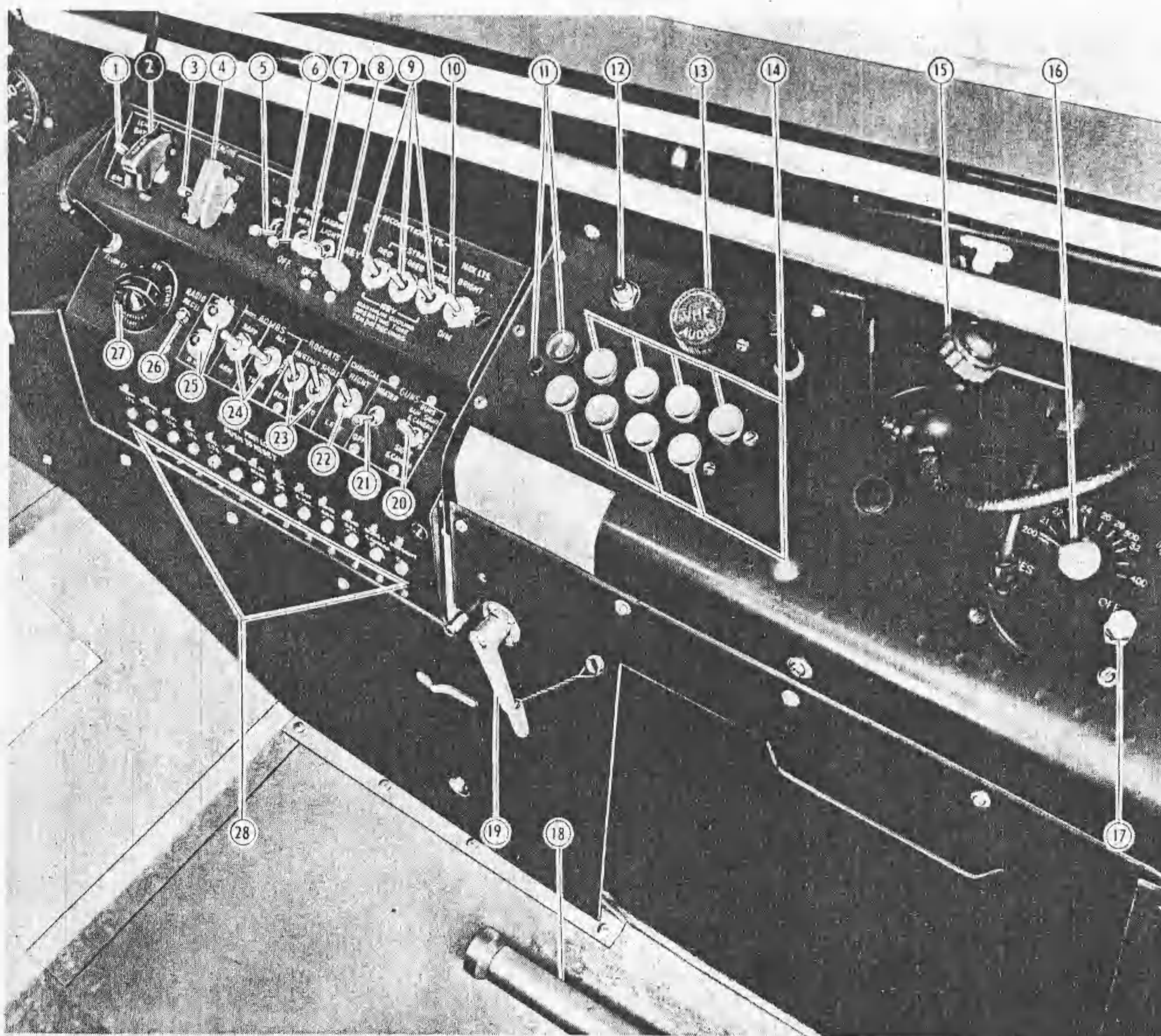
Figure 6 — Cockpit, Left-hand Side





- | | |
|-----------------------------------|---|
| 1. Stand-by compass | 18. Fire warning light |
| 2. Altimeter | 19. Elevator tab switch |
| 3. Air speed | 20. Droppable tank (bomb) release |
| 4. Turn and bank | 21. Control stick |
| 5. Directional gyro | 22. Main tank low level warning light |
| 6. Rate of climb | 23. Main tank fuel quantity |
| 7. Compass correction card | 24. Instrument pressure |
| 8. Gun-sight mount | 25. Parking brake handle |
| 9. Landing light position control | 26. Landing gear position lights |
| 10. Remote compass indicator | 27. Hydraulic pressure |
| 11. Gyro-horizon | 28. Clock |
| 12. Burner ring fuel pressure | 29. Elevator tab neutral light |
| 13. Engine tachometer | 30. Emergency fuel pump indicator light |
| 14. Jet temperature | 31. Rudder pedal ratchet release |
| 15. Ammeter | 32. Oxygen pressure |
| 16. Engine oil pressure | 33. Oxygen flow indicator |
| 17. Rear bearing temperature | |

Figure 7 — Instrument Panel



- | | |
|--------------------------------------|--|
| 1. Ignition booster switch | 15. Fluorescent light |
| 2. Starter switch | 16. Beacon receiver tuning knob |
| 3. Battery master switch | 17. Beacon receiver volume control |
| 4. Generator switch | 18. Emergency hydraulic hand pump |
| 5. Oil heat switch | 19. Landing gear emergency selector |
| 6. Pitot heat switch | 20. Gun-camera switch |
| 7. Landing light switch | 21. Gun heater switch |
| 8. Recognition light key | 22. Chemical tank switch |
| 9. Recognition light switches | 23. Rocket switches |
| 10. Navigation light switch | 24. Bomb switches |
| 11. V.H.F. radio "OFF" switches | 25. Bomb indicator lights |
| 12. Radio tone key | 26. Radio receiver circuit breaker re-set button |
| 13. Radio audio (volume) control | 27. Fluorescent light switch |
| 14. V.H.F. frequency selector button | 28. Circuit breaker re-set buttons |

Figure 8 — Cockpit, Right-hand Side

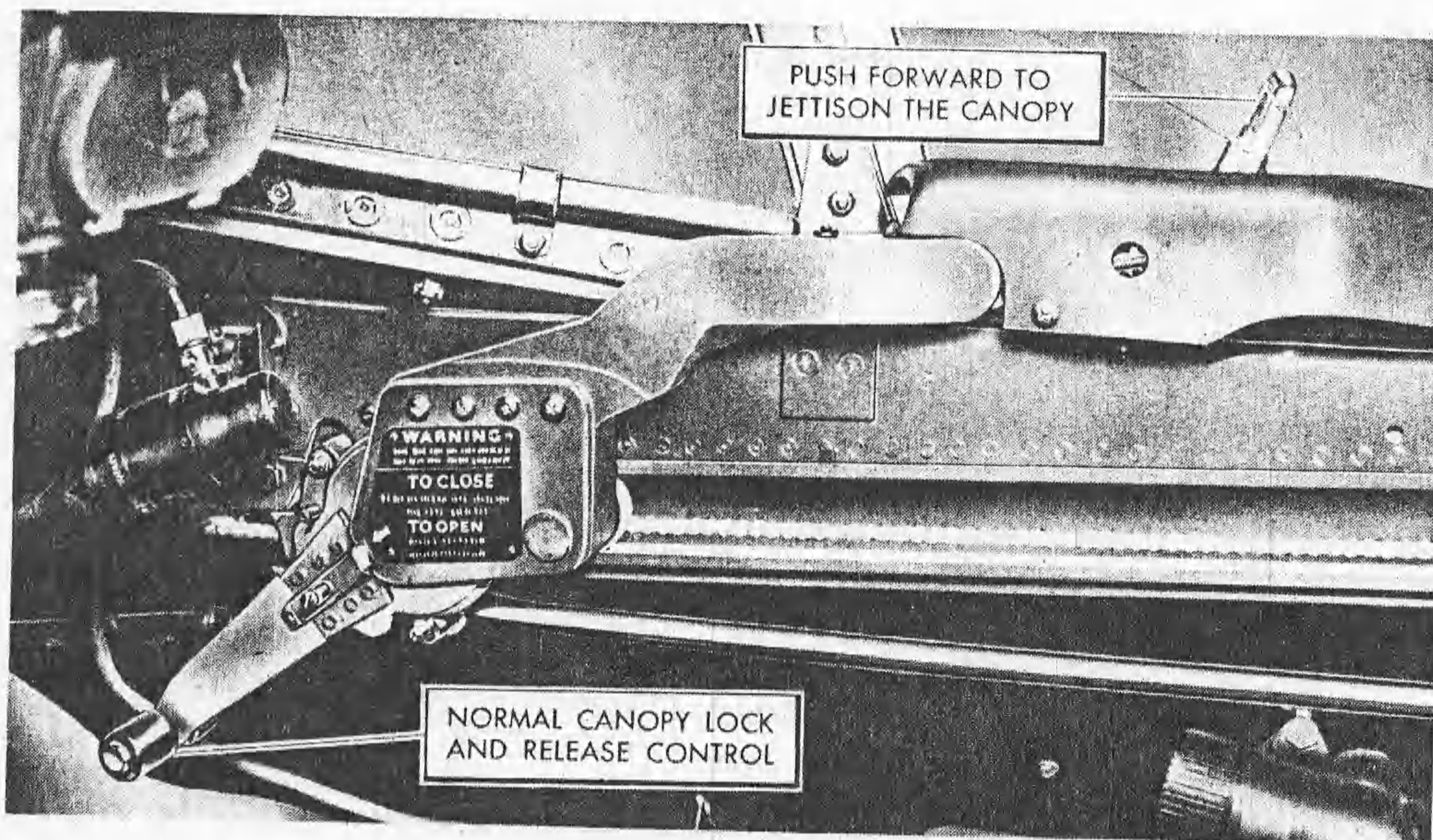


Figure 10 — Canopy Controls

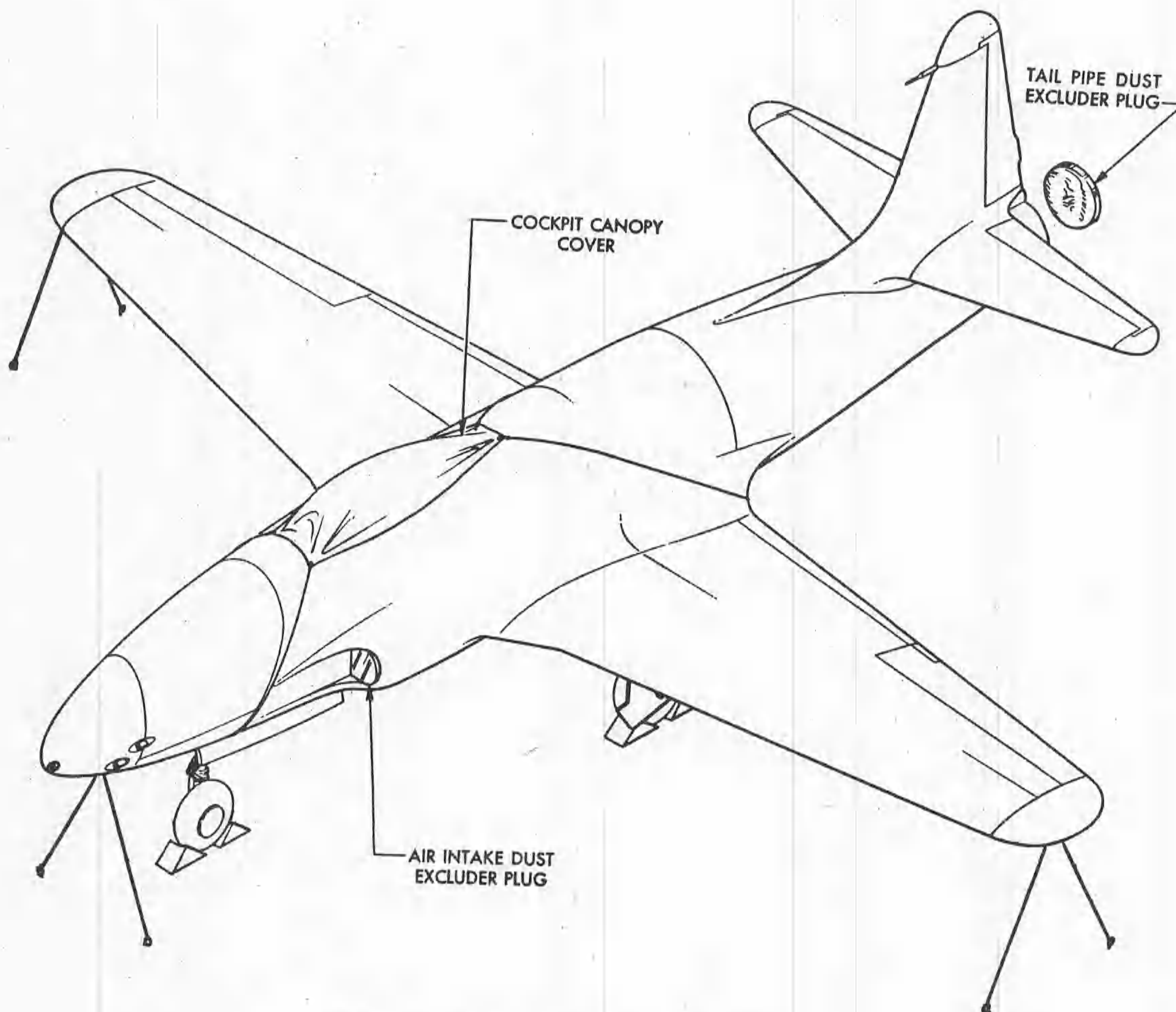


Figure 11 — Mooring Diagram

3. ARMAMENT.

a. GUNNERY EQUIPMENT.

(1) The six—.50 caliber guns each carry 300 rounds of ammunition when fully loaded.

(2) A gun camera, mounted in the lip of the right engine intake duct, operates with the guns or separately.

(3) To operate the guns and the camera, set the gun-camera switch (figure 8-20) to *guns and camera* and operate the control stick trigger.

(4) To operate the camera alone, set the gun-camera switch to *camera* and operate the control stick trigger.

(5) The gun sight should be in operation at full speed during take-off and landing to reduce the possibility of damage resulting from shocks.

4. COMMUNICATIONS EQUIPMENT.

a. An AN/ARC-3 Radio receiver-transmitter is standard equipment in this airplane. The controls for this set are shown in figure 8, items 11 through 14.

(1) To turn the radio on, press any of the frequency selector push buttons and wait about one minute for the set to warm up.

(2) To transmit, press the microphone button (figure 6-8) and speak.

(3) To transmit code, use the tone control button (figure 8-12) as a key.

(4) To turn the equipment off, press both the off buttons (figure 8-11) simultaneously.

b. A beacon receiver, BC-1206, covers frequencies between 200 and 400 K.C. Controls for this set are shown in figure 8, items 16 and 17.

c. An SCR 695 identification radio is standard equipment. The controls for this set are shown in figure 6-1.

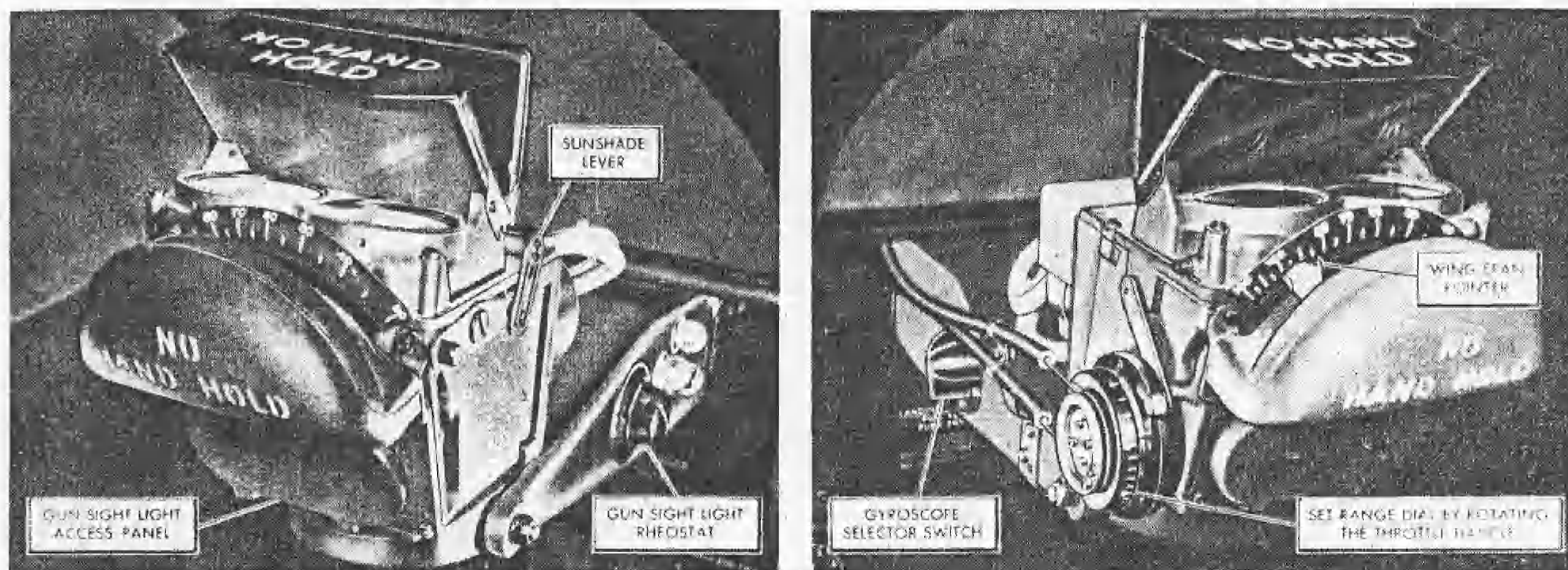


Figure 16 — K-14 Gunsight Controls

(a) Turn the gun sight on (by turning the gun-camera switch to *camera* or *guns and camera*) before starting the engine and leave it in operation until after landing.

Note

Approximately 15 minutes is required for the gun sight gyro to reach its operating rpm. It must be turned on at least 15 minutes before using.

b. BOMBING EQUIPMENT.

(1) To release bombs individually, place bomb switch to train, then press button on top of stick grip successively. To release bombs simultaneously place bomb switch to all.

c. ROCKETS AND CHEMICAL TANKS. — The rocket and chemical tank installations have not yet been flight tested.

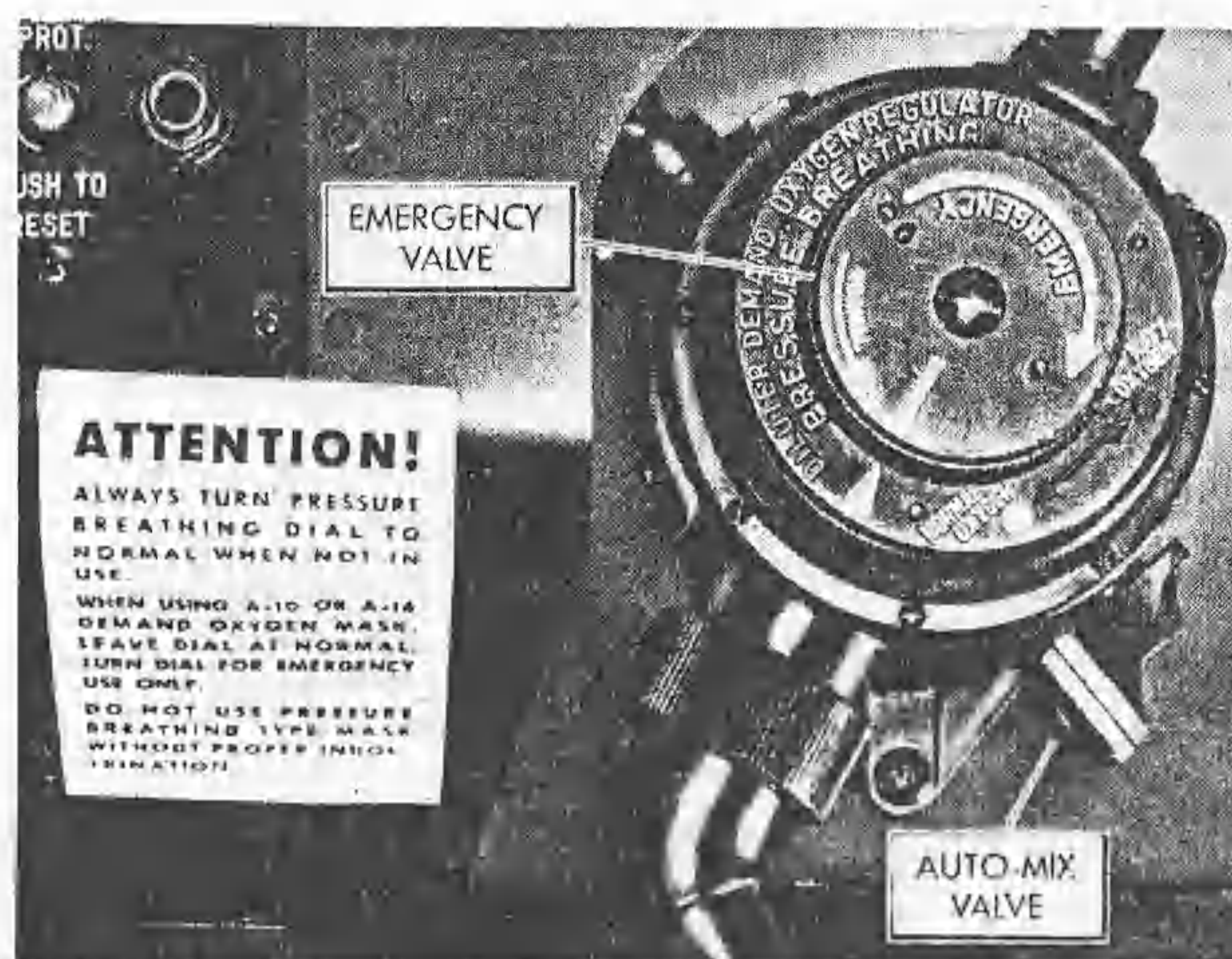


Figure 17 — Oxygen Controls

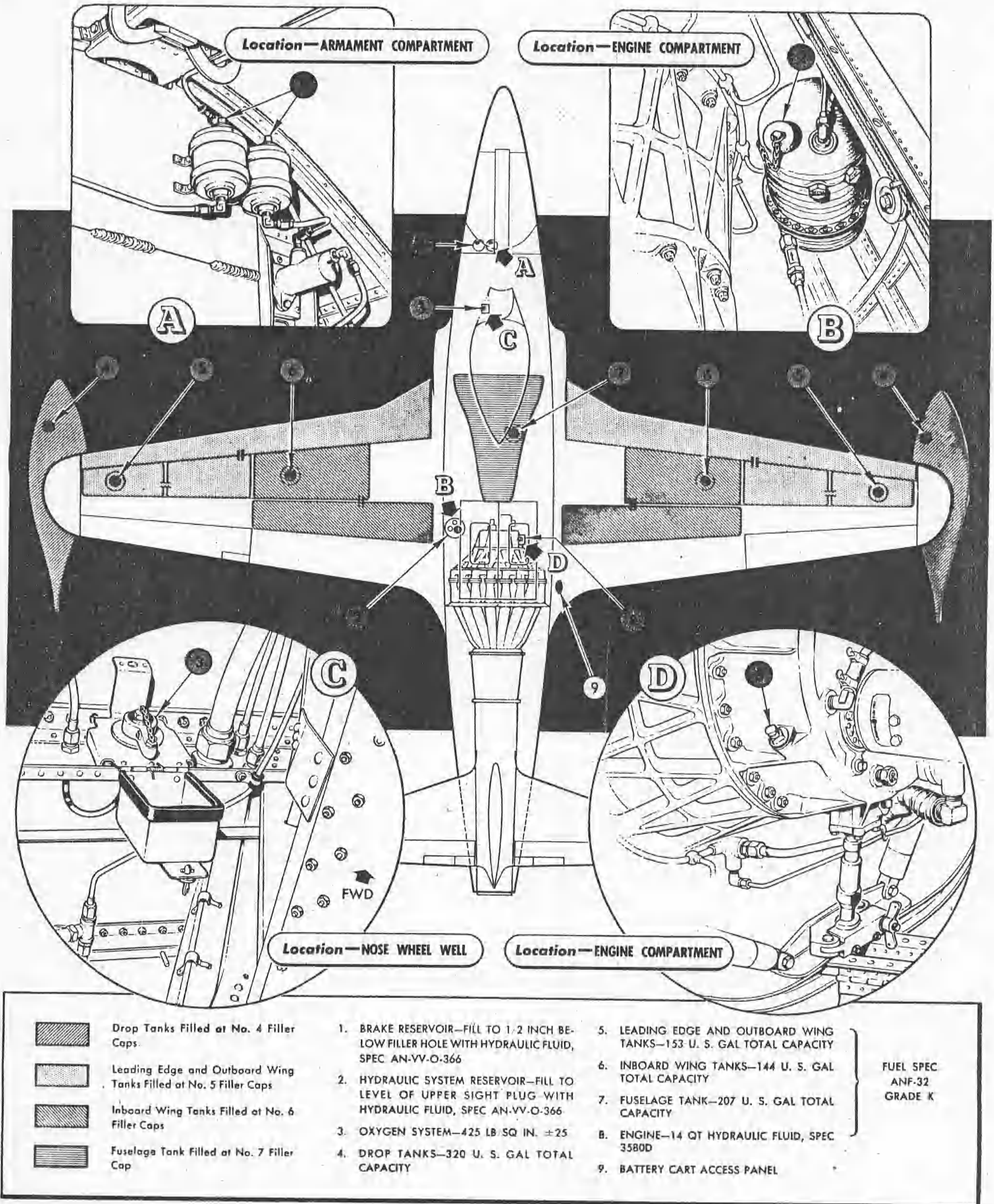


Figure 18 — Replenishment Diagram

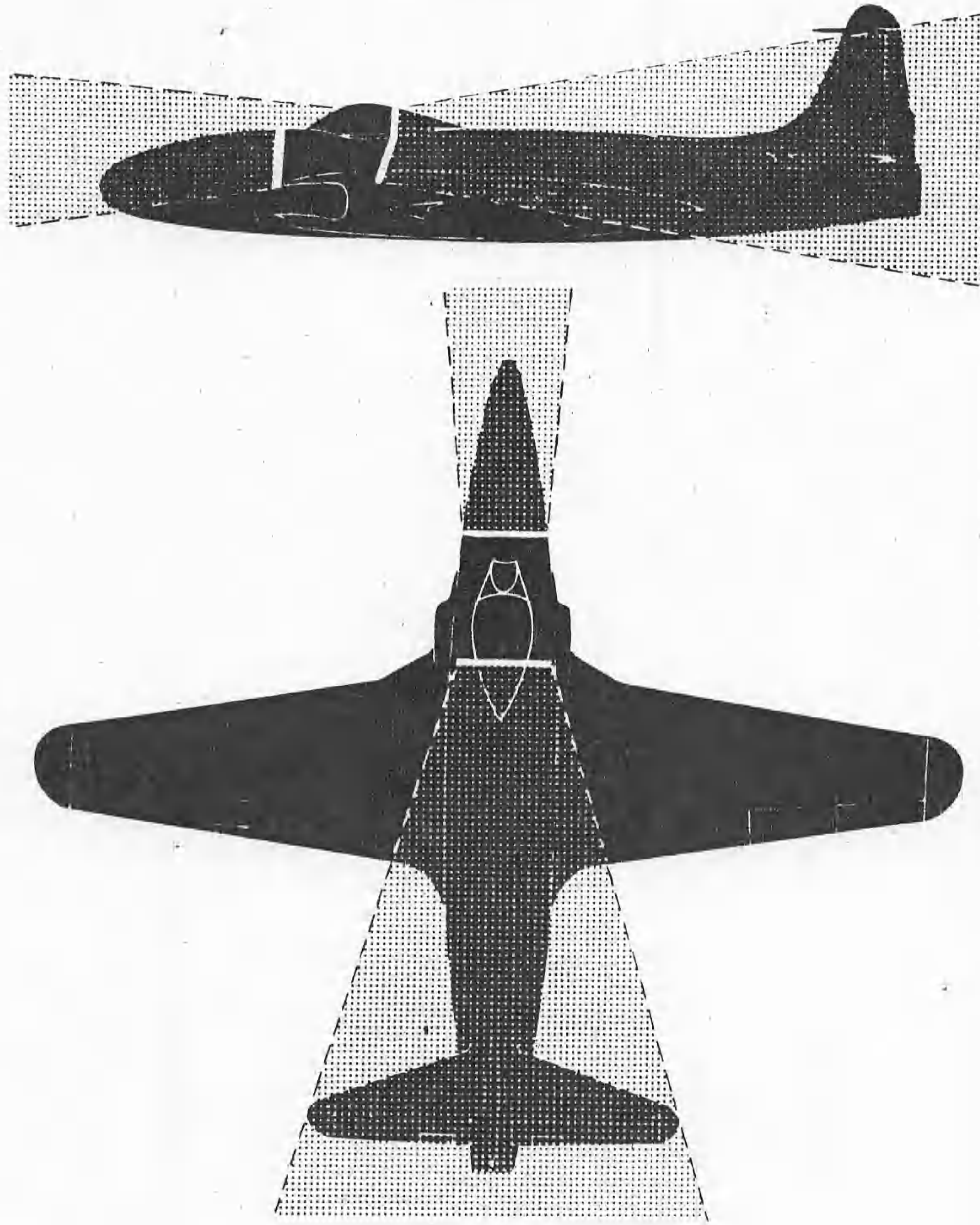


Figure 19 — Armor Protection Diagram

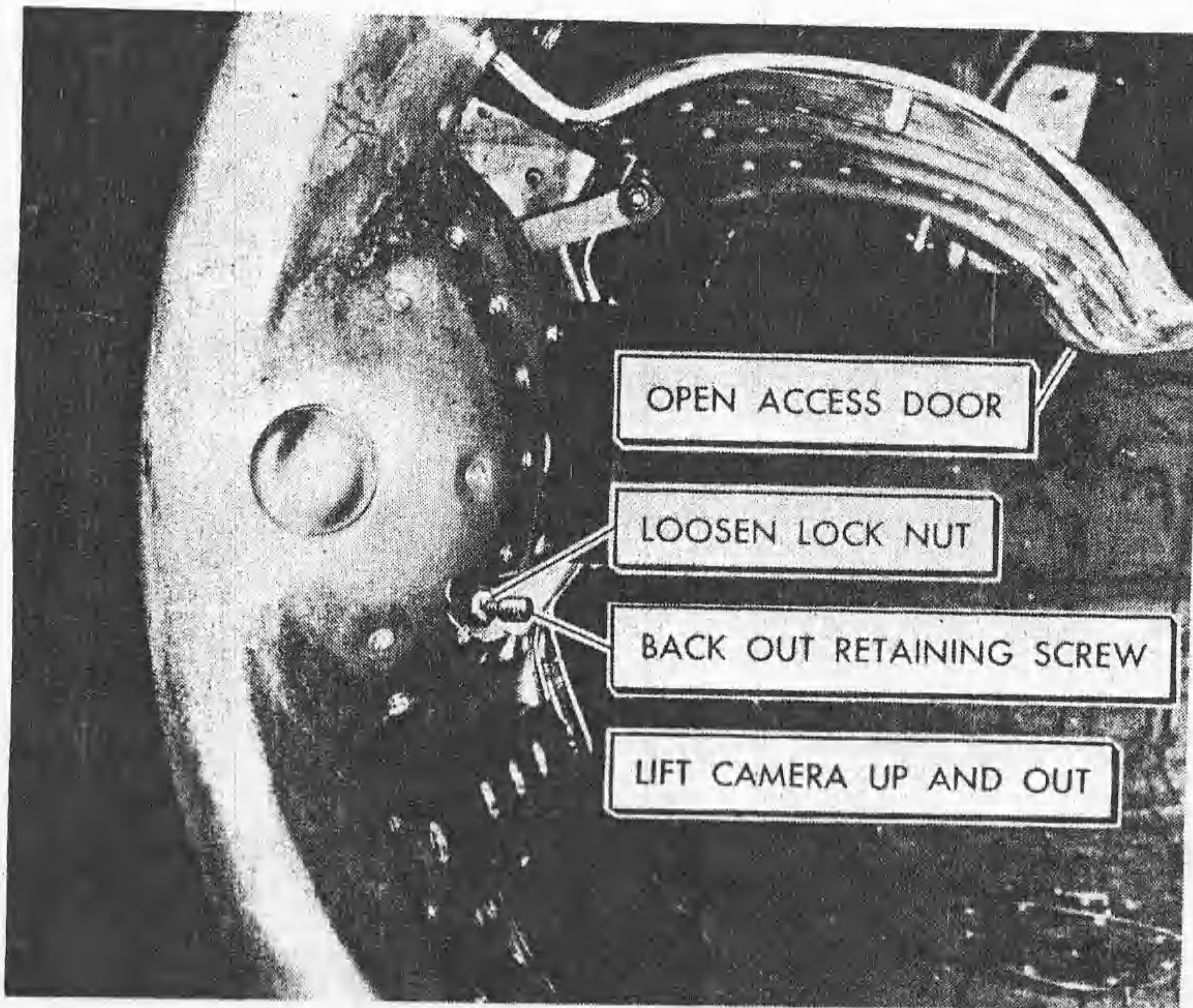


Figure 20 — Gun Camera Removal