INSTRUCTION MANUAL

GAMMACELL 220

COBALT 60 IRRADIATION UNIT

Edition No. 6, July, 1968

ATOMIC ENERGY OF CANADA LIMITED

COMMERCIAL PRODUCTS, P.O. BOX 93, OTTAWA, CANADA

INDEX

LIST OF ILLUSTRATIONS

PART 1

DESCRIPTION

GENERAL

The Gammacell 220 is a Cobalt 60 irradiation facility manufactured by Atomic Energy of Canada Limited for use in an unshielded room. Figure 1 illustrates the external features and Figure 2 the general dimensions of the unit.

The unit basically consists of an annular source (see Figure 3) permanently enclosed within a lead shield, a cylindrical drawer, and a drive mechanism to move the drawer up or down along the source centre-line. The drawer has a chamber to carry samples to be irradiated from outside the shield to the source.

Samples up to approximately six inches in diameter and eight inches in height can be accommodated in the chamber. Liquid, gaseous, electrical or mechanical connections can be introduced into the sample chamber through an access tube in the upper portion of the drawer. An electrically powered digital timer automatically raises the drawer at the termination of a sample irradiation. Times may be preset to a maximum of 999.9 hours.

ELECTRICAL

The Gammacell 220 operates on a 220 volt, 3 phase, 60 Hertz, 15 ampere supply. The supply is connected through a starter to a ½ hp drive motor. A step-down transformer connected across one phase of the supply provides the 115 volt, 1 ampere control circuit requirement.

WEIGHT

Crated	8,500 lb (3856 kg)
Uncrated	8,300 lb (3765 kg)

HEAD

The head (see Figure 1) serves as a cylindrical shield for the source and as a guide for the moving drawer. It consists of a leak-proof shaped cylinder which contains approximately six thousand pounds of lead to provide ten inch thick shielding. A stepped, circular hole running vertically through the centre of the head locates the inner head plug, the source cage assembly and the moving drawer.

COLLAR

Mounted on top of the head is a 6½ inch (16.51 cm) deep lead filled annular steel collar. The collar provides shielding for the transient beam occurring when the relatively unshielded volume of the sample chamber moves through the inner plug. The rear, semi-circular portion of the collar is attached to the head. The front portion opens as two doors, each hinged to the rear portion of collar. Pressure on a lever behind the handle on the right door raises a latch and permits the overlapping doors to be opened. The doors should be opened only when the drawer is raised, when access is required to the sample chamber.

INNER HEAD PLUG

The inner head plug is a lead filled steel cylinder which fits into the head above the source

cage. It forms part of the shielding and also houses the upper drawer guides. The plug must not be removed except for source changing procedures supervised by A.E.C.L. staff.

SOURCE CAGE ASSEMBLY

The source cage is located in the centre of the head directly beneath the inner head plug. The stainless steel cage contains forty-eight double-sealed source pencils, each 8.31 inches (21.11 cm) long, set in an annular formation on an 8.23 inch (20.91 cm) pitch circle diameter (see Figure 3). Each tubular pencil contains seven Cobalt 60 slugs completely sealed in by welded end caps.

The inside diameter of the cage is sufficiently greater than the diameter of the drawer to prevent excess radiation leakage through the clearance between the drawer and head.

DRAWER

The drawer moves vertically through the centre of the head, inner plug and source cage assembly. It is 59.0 inches (149.86 cm) long and 6½ inches (16.51 cm) in diameter, and is constructed from four distinct components; the top shielding plug, the drawer top, the sample chamber and the drawer bottom. The top shielding plug is hinged to the drawer top. The other three components are keyed together to ensure mechanical alignment and secured with screws. The drawer is guided in the head and inner head plug by four bronze bearings.

TOP SHIELDING PLUG

The lead filled closed steel cylindrical plug is 4 inches (10.16 cm) in diameter and 5¼ inches (13.34 cm) long. It is hinged to a steel casting on the drawer top and provides a radiation shield over the drawer top access tube. When the drawer is raised the top plug may be tilted back to permit the introduction of accessories into the sample chamber, see Figure 5. Electrical interlocks prevent the drawer being lowered with the plug in the open position. During a sample irradiation procedure the plug must not be opened.

DRAWER TOP

The 6½ inch (16.51 cm) diameter, 14-3/8 inch (36.51 cm) long closed steel cylinder has a 1¼ inch (3.17 cm) inside diameter access tube through its centre. The space between the chrome plated outer casing and the stainless steel access tube is filled with lead. Welded to the drawer top is a steel casting onto which the top shielding plug is hinged. The casting is shaped to provide indirect entry to the access tube; it also provides two sockets tapped ½ — 20 UNF — 2B, 3/4 inch (1.91 cm) deep to accommodate accessory mounting posts. The access tube has a one inch (2.54 cm) deep, 1-3/8-12-2B female thread to accept the tube insert accessory assembly.

SAMPLE CHAMBER

The chamber is a thin wall closed, non-corrosive metal cylinder with a lift out full width door. The inside dimensions of the chamber are 6.10 inches (15.49 cm) diameter and 8.06 inches (20.47 cm) high. The access port is 7.91 inches (20.07 cm) high and 6.00 inches (15.24 cm) wide. A step on the bottom of the door and a locking ring at the top of the chamber retain the door in place, see Figure 4. An opening is provided in the top and bottom of the chamber for the access and drain tubes. Electrical interlocks prevent drawer movement when the door or door latch is improperly closed.

DRAWER BOTTOM

The drawer bottom is formed from a 6.5 inch (16.51 cm) diameter, 30.5 inch (77.47 cm) long steel tube, lead filled, and closed at both ends. A spiral stainless steel drain tube, 7/16 inch (1.11 cm) internal diameter, runs the length of the drawer bottom to facilitate drainage of liquid spills in the sample chamber. The drawer bottom is sufficiently long enough to provide irradiation shielding beneath the source chamber when the drawer is up or down.

A rectangular bracket on the base of the drawer provides a pin joint connection to the drive mechanism.

DRIVE MECHANISM

The drawer assembly is raised or lowered by a chain and sprocket system (see Figure 6). The system motive power is provided by a ½ hp, 220 volt, 3 phase motor; the output speed of which is reduced initially through a V-belt and pulley connection to a worm and gear reducer. Further speed reduction is obtained through a chain and sprocket drive to a shaft. A sprocket at each end of the shaft transmits the shaft rotation to the smaller of double head sprockets mounted each side of the head base. The head sprockets rotate less than one revolution each complete up or down movement of the drawer. Two roller chains are pinned at one end to each of the larger of the double head sprockets and at the other end to each end of a full width T-bar. The T-bar is pin jointed to a bracket on the bottom of the drawer. With the partial rotation of the head sprockets on upward drawer movement the lift chains wrap around the sprockets and raise the T-bar.

DRAWER MOVEMENT

Drawer movement is electrically governed by the control panel. Microswitches mounted on the head sprockets are cam actuated, Figure 7, before the end of drawer travel and disconnect the electrical supply to the motor. The momentum of the drawer carries it the remaining distance to the mechanical stops. The drawer travels 19.72 inches (50.02 cm) in approximately seven seconds.

Mechanical stops are provided at the limits of the drawer movement. The upper stop is formed from an adjustable bolt, mounted on the underside of the shield head, which stops against a nylon pad inserted in the top side of the T-bar. The lower stop is formed from a nylon tipped adjustable bolt, mounted on a fixed bracket (see Figure 7), which stops against the underside of the drawer when it reaches the lowest point of its movement.

A hand crank is provided to enable the drawer to be operated manually in the event of a power supply failure.

CONTROL PANEL

The unit controls are grouped on one panel situated at the top right of the head, as illustrated in Figure 8. From the top of the panel the controls are:

1. Digital timer — to provide irradiation time settings to a maximum of 999.9 hours. A reset button returns the timer to its original setting. The timer commences operation when the drawer reaches the irradiation position.
2. Selector switch — to provide for manual operation or selection of time settings in seconds, minutes or hours.
3. Movement switch — to select up or down drawer movement.
4. Key switch — to control the electrical supply to the unit control circuit.

SAFETY FEATURES

For the protection of the operator several safety features have been incorporated in the unit.

Three microswitches are mounted on the collar door (Figure 9) to ensure that:

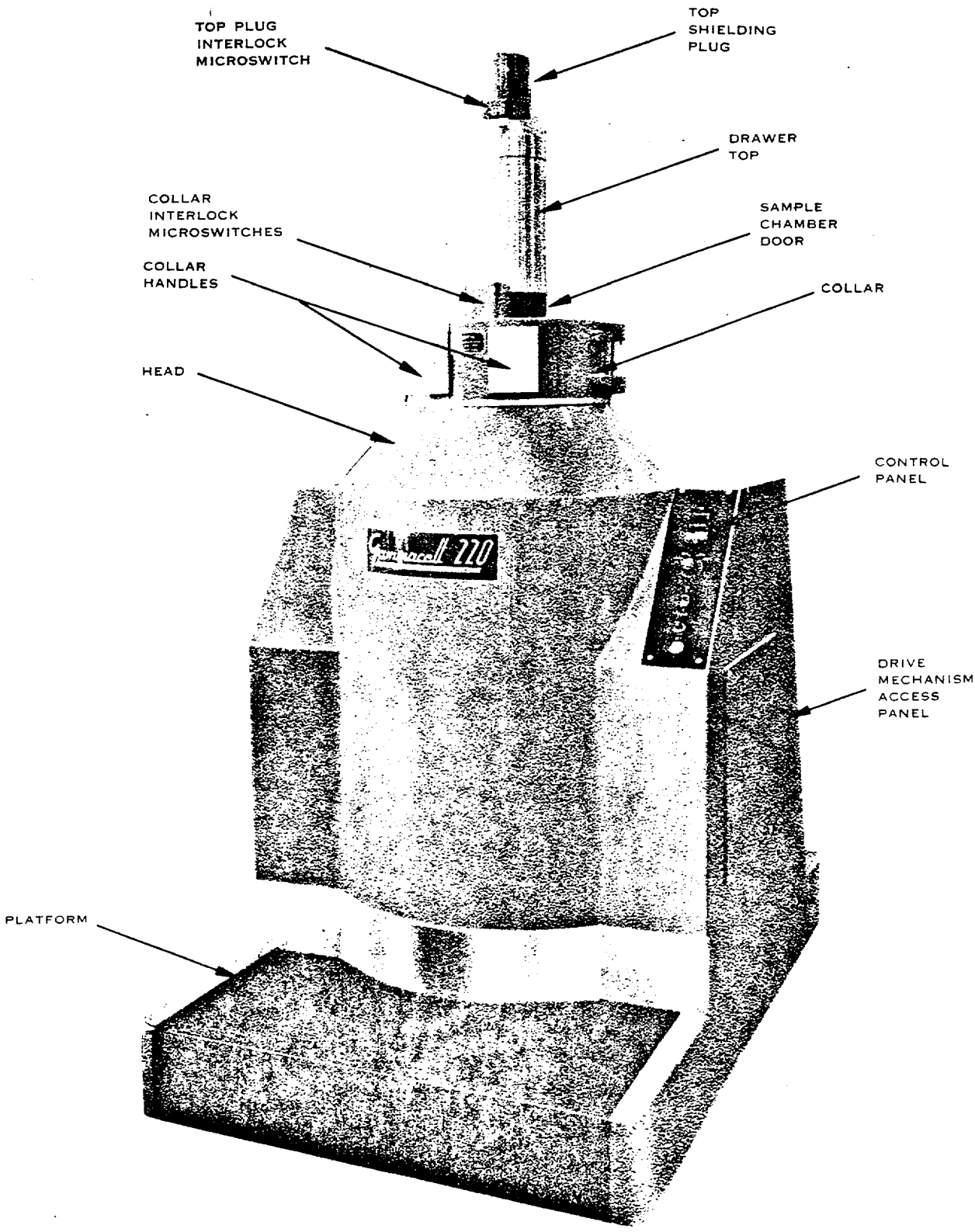
a) the sample chamber door is properly located.
b) the locking ring is in position.
c) both collar doors are closed.

A fourth microswitch is located on the top shielding plug to ensure that the plug is closed. Unless all four microswitches are actuated the drive motor will not start.

The self-locking feature of the worm gear reducer acts as a brake to prevent the drawer moving down under its own weight.

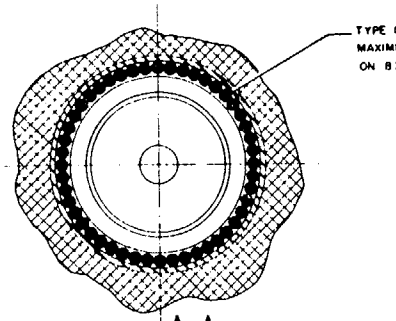
A solenoid operated ram, mounted on the underside of the head, actuates when the drawer stops in the raised position. The ram locates against a rectangular bracket on the drawer bottom and prevents the drawer moving down in the event of a drive system mechanical failure.

Drawer movement can be arrested by switching off the electrical supply key switch.



OVERALL VIEW OF GAMMACELL 220

FIGURE 1



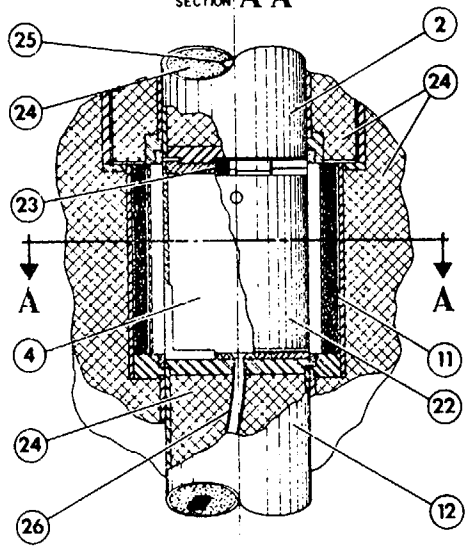
NOTES

1 - IRRADIATION CHAMBER INSIDE DIMENSIONS 8.06 IN. (20.47 CM.) x 6.10 IN. (15.49 CM.) I.D.

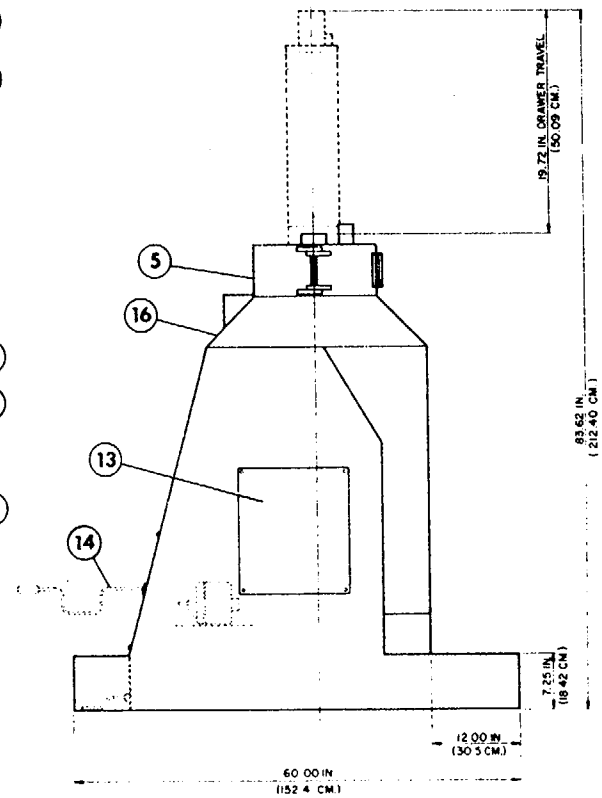
2 - DOOR APERTURE 7.91 IN. (20.07 CM.) x 6.00 IN. x (15.24 CM.) WIDE.

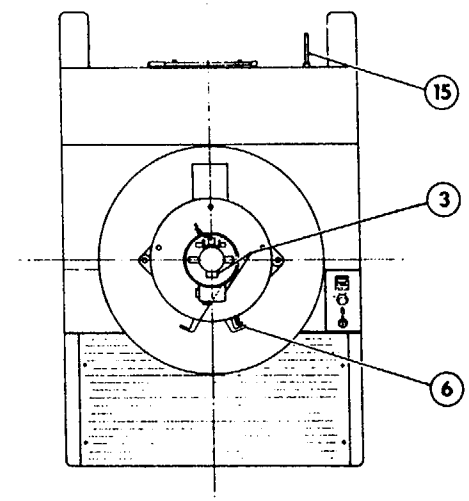
3 - LIFT TRUCK CAVITY DIMENSIONS. 7 IN. (18 CM.) x 32 IN. (82 CM.)

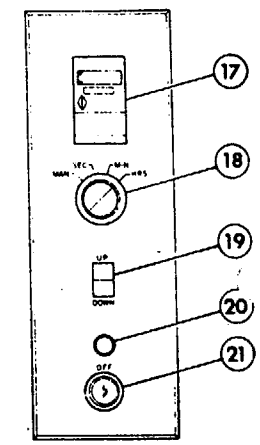
4 - INSTALLATION CLEARANCE REAR - 24 IN. (61 CM.)
SIDES - 30 IN. (76 CM.)



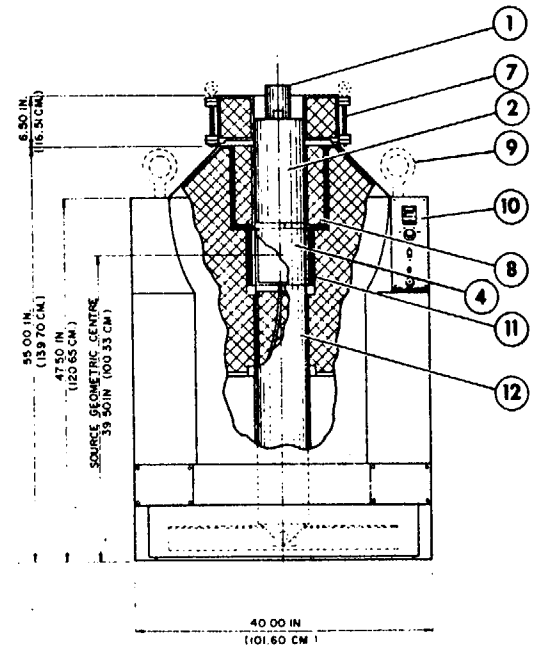
SAMPLE CHAMBER & SOURCE ASSEMBLY





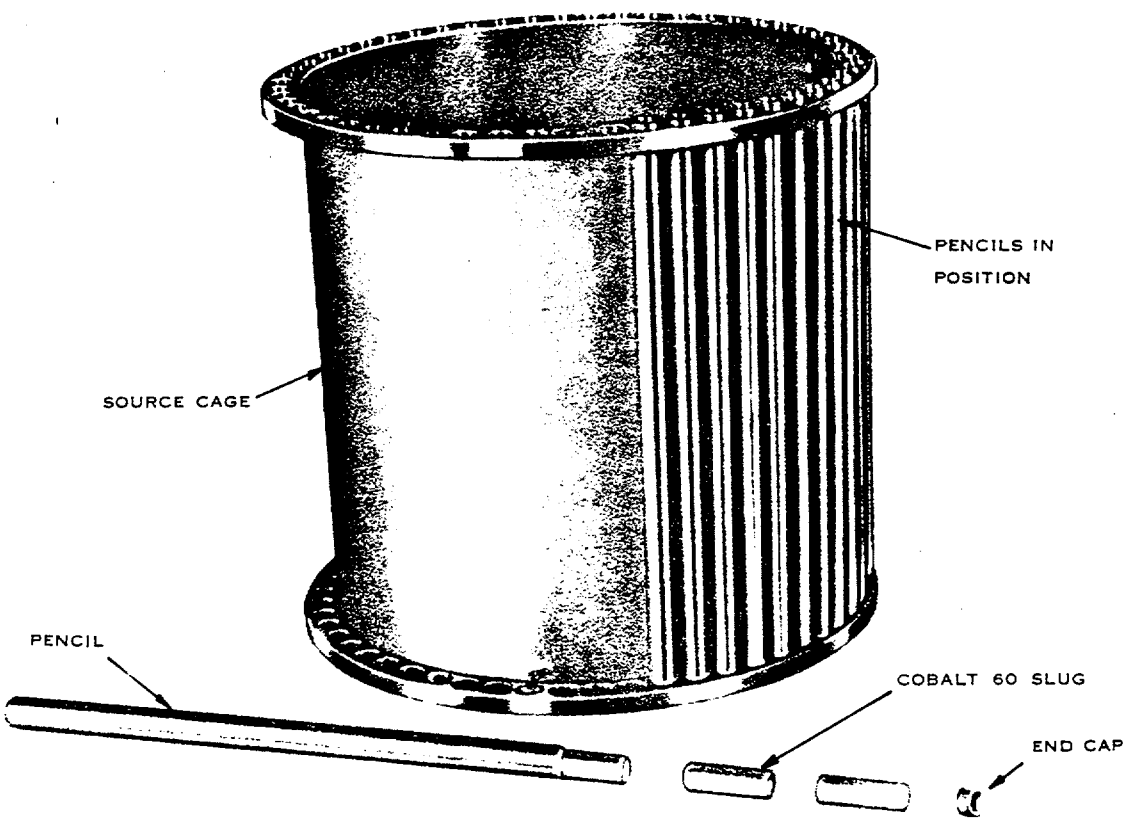


CONTROL PANEL



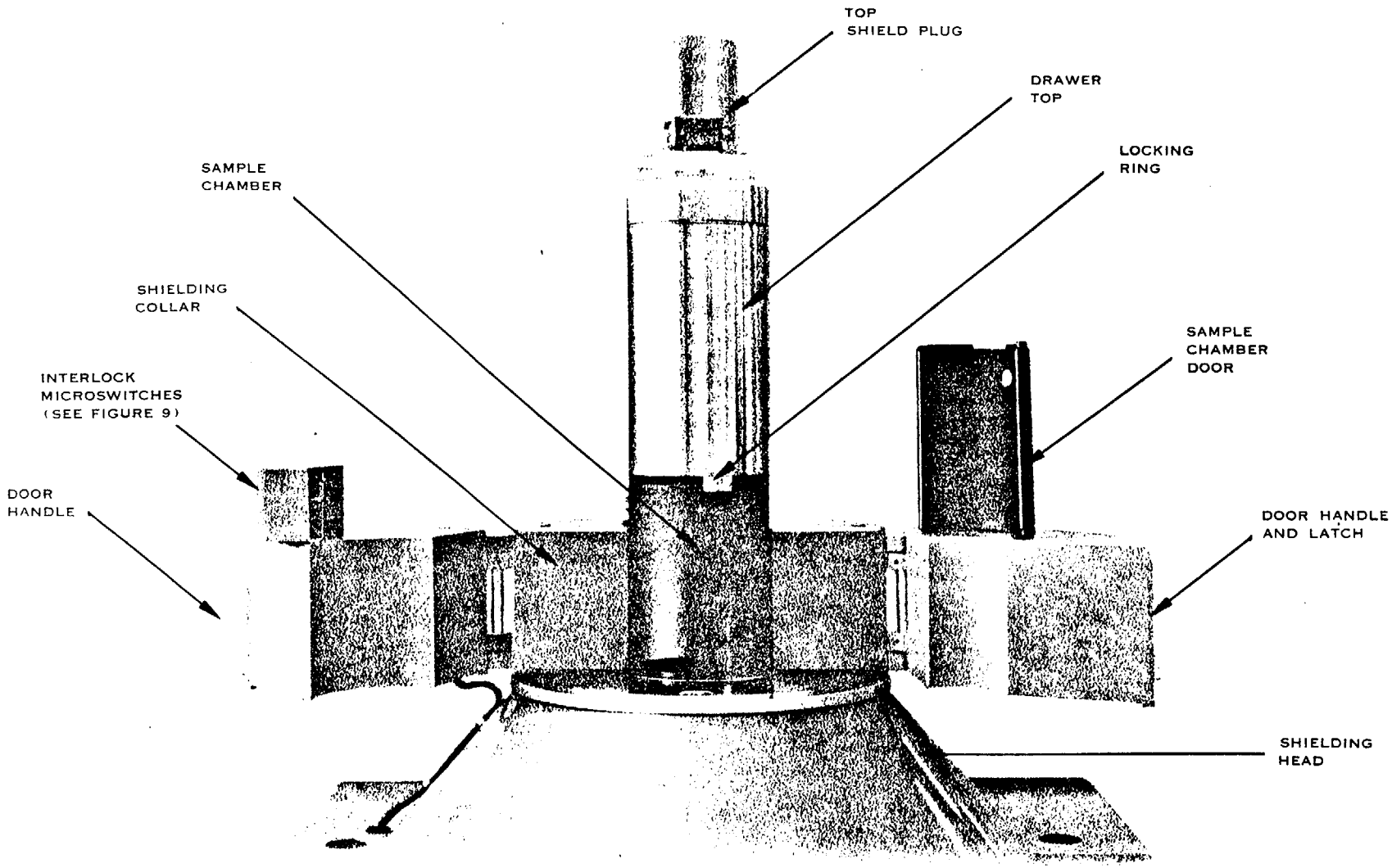
1 TOP SHIELD PLUG
2 DRAWER TOP
3 SAFETY INTERLOCK MICROSWITCHES
4 SAMPLE CHAMBER
5 SHIELD COLLAR
6 COLLAR DOOR HANDLE & LATCH
7 COLLAR DOOR HINGE
8 INNER HEAD PLUG
9 REMOVABLE LIFTING LUGS
10 CONTROL PANEL (SEE DETAIL)
11 SOURCE PENCIL ASSEMBLY (SEE DETAIL)
12 DRAWER BOTTOM
13 ENCLOSED DRIVE MECHANISM
14 DRAWER MANUAL CRANK
15 ELECTRICAL CABLE
16 SHIELDING HEAD
17 DIGITAL TIMER
18 TIME MEDIA SELECTOR SWITCH
19 DRAWER UP-DOWN SWITCH
20 FUSE
21 KEY SWITCH
22 SAMPLE CHAMBER DOOR
23 SLIDING DOOR LATCH
24 LEAD SHIELDING
25 ACCESS TUBE, STAINLESS STEEL, INTERNAL DIAMETER 1.25 IN. (3.17 CM.)
26 SPIRAL DRAIN TUBE, STAINLESS STEEL, INTERNAL DIAMETER 0.43 IN. (1.09 CM.)

GAMMACELL 220
GENERAL DIMENSIONS
FIGURE 2



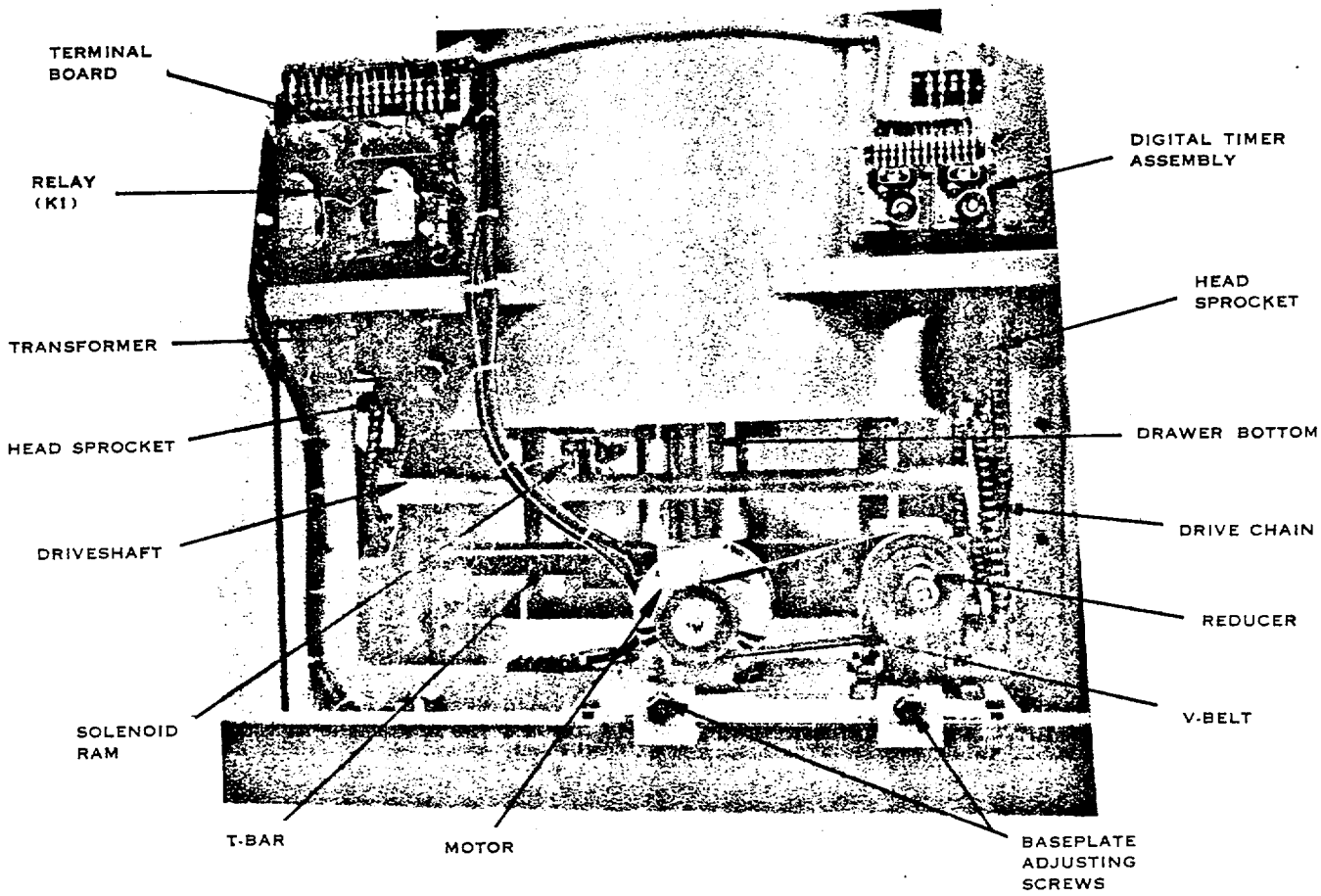
SOURCE PENCILS AND CAGE

FIGURE 3



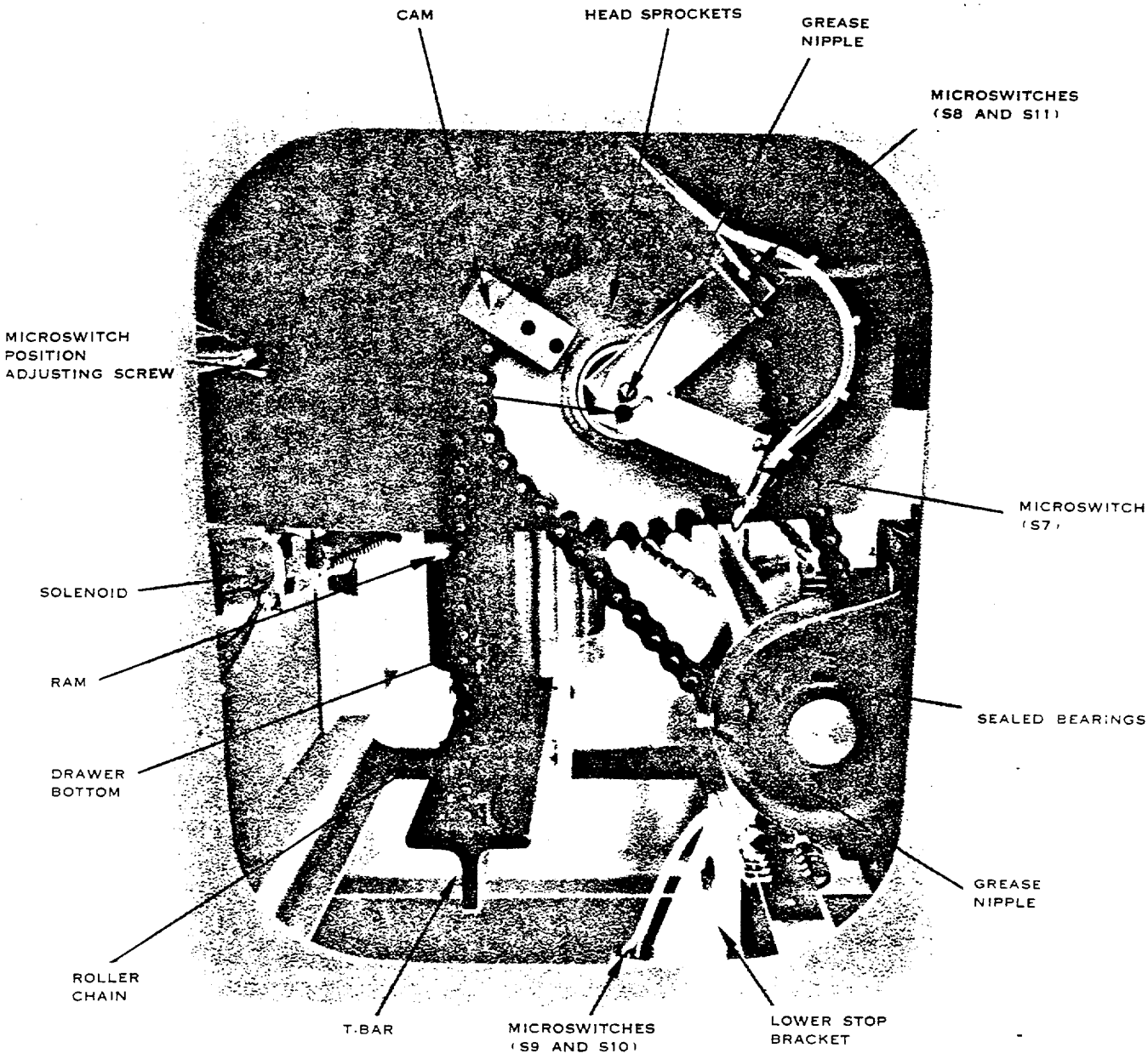
COLLAR AND SAMPLE CHAMBER

FIGURE 4



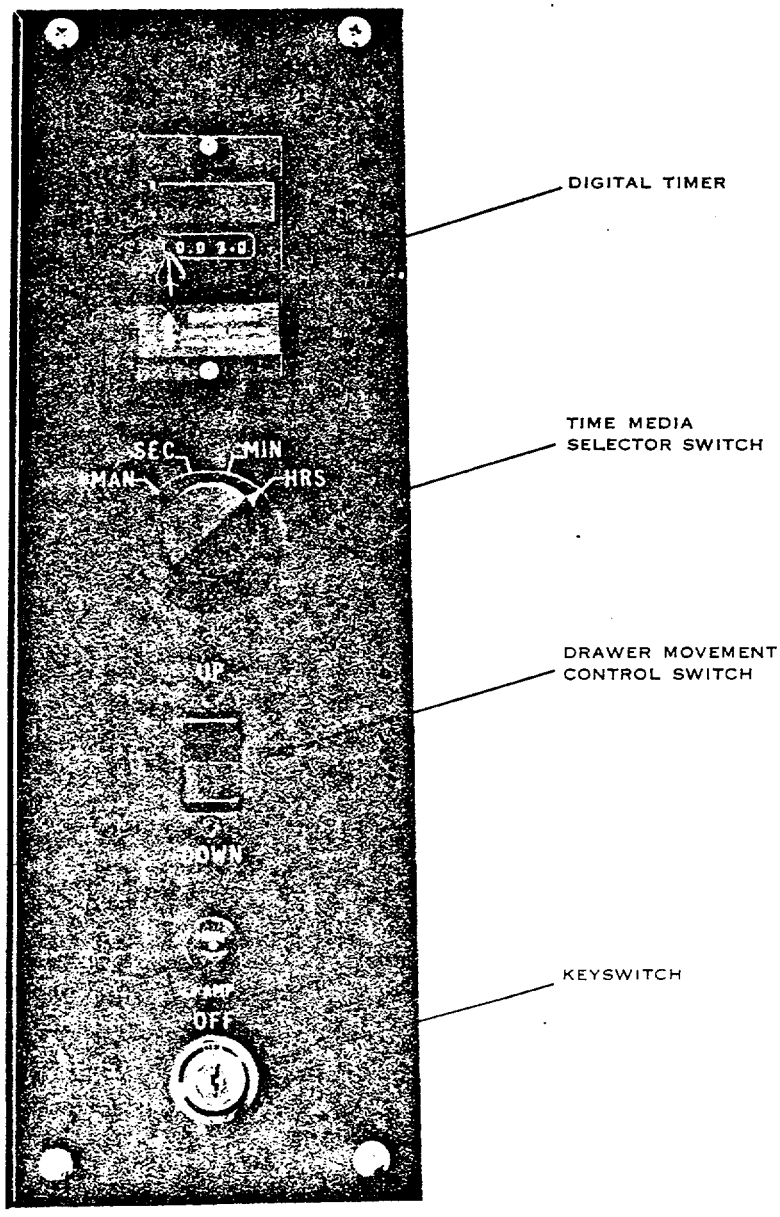
REAR OF UNIT

FIGURE 6



DRIVE MECHANISM

FIGURE 7



CONTROL PANEL

FIGURE 8

PART 2

OPERATION

The Gammacell 220 has been designed to enable operation with minimum exposure to radiation. To ensure protection, operators should adhere to the following procedures.

AUTOMATIC OPERATION

1. Raise the drawer by first inserting the key in the key switch and turning it 90° clockwise, then press the UP rocker switch.

2. Open the collar doors by grasping the handles and pulling on the lever behind the right handle.

3. Slide the sample chamber locking ring to the right, remove the door by lifting it up and outwards.

4. Place the sample in the chamber. The access tube in the drawer top accommodates accessory tubes and electrical leads, which should be fitted in accordance with the instructions provided in the Gammacell 220 Accessories Manual.

   NOTE: Materials expected to change state during irradiation should be placed in suitable containers.

   Liquids expected to expand or boil should be provided with secondary containers for overflow, or vented to one of the access tubes .

   The sample chamber and source cage will not withstand repeated spills of corrosive materials.

5. Replace the sample chamber door with a forward and downward motion. Move the locking ring to the left until it snaps into position. If difficulties are experienced check that the door is correctly positioned in the port.

6. Close the collar doors, the left one first; ensure that the latch locks the door in place.

7. Set the required irradiation time on the digital timer in the following manner. (Refer to Figure 8.)

   a) Push the timer reset knob, turn it clockwise 90°, and release; the white line on the knob should be horizontal.

   b) Open the hinged cover which protects the predetermining drums; turn the knurled wheels either direction until the desired number sequence appears in the windows.

   c) Rotate the selector switch to hours, minutes or seconds. Close the hinged cover and turn the timer reset knob counterclockwise; the white line on the knob should be vertical, press the reset knob to set the timer.

8. Push the DOWN switch. The drawer will lower to the irradiating position, activate the timer, and remain there until the preset time interval has elapsed, when it will automatically raise.

9. To remove the sample repeat steps 2 and 3.

MANUAL OPERATION

1. For initial set-up read the preceding steps 2 to 6.
2. Rotate the selector switch to MANUAL.
3. Press the DOWN switch. The drawer will lower and remain there indefinitely until the UP switch is operated.

POWER FAILURE

In the event of a power failure the timer will stop and it will be necessary to raise the drawer manually.

1. Turn the key switch to the OFF position.
2. Spring out the large round button near the lower right corner of the back cover.
3. Push the crank (Figure 2, item 14) through the hole until it snaps into the extension on the input shaft of the reducer.
4. Crank in a clockwise direction to raise the drawer.

NOTE:

1. If it is necessary to change an operation time do not alter the digit settings while the drawer is down and the timer is operating. Raise the drawer and set the timer as described in AUTOMATIC OPERATION, step 7.
2. On completion of a timed operation the timer can be reset to the same operation time by depressing the reset knob.
3. If it is required that the drawer be raised during an operation the timer will store the remaining portion of the preset time until the operation is resumed.

PART 3

MAINTENANCE

The back and both side panels are removable, and provide access to the drive mechanism.

PREVENTIVE

Every six months. (Refer to Figures 6 and 7).

1. Motor — add a few drops of oil to both oil cups.
2. Worm Gear Reducer — remove the oil level plug on the left side of the reducer. If no oil is visible, remove the filler plug on top and fill to oil level hole with SAE 60 oil.
3. Shaft Bearings — apply a good quality bearing grease to the grease nipples on both sealed bearings and both sets of head sprockets. Do not use oil.
4. Chains — wipe with an oil-soaked cloth.

GENERAL

Mechanical — Collar Doors

The collar doors are adjusted to be as close as possible to the top surface of the inner head plug. If they become difficult to open (appear to drag), turn the adjusting screw on the underside of the hinges inward until the doors will move freely.

V-Belt

Check the V-belt periodically for signs of wear. Belt tension should be such that the total vertical belt deflection midway between the motor and the reducer is approximately one-half inch (1.27 cm). If adjustment is required, loosen the four motor mounting screws and move the motor to suit. If the belt is too loose the motor drive sprocket will slip and not transmit movement to the drawer.

Chains

Prior to adjusting the roller chain, raise the drawer, switch off the electrical supply and crank the drawer down until it rests on the bottom stop. After adjustments are made and all bolts are tightened, crank the drawer back to the raised position.

The reducer output chain may become slack due to initial stretching under load. Depending on the position of the drawer one side of the chain will always be taut, but the other side may be slack. If the total movement play on the slack side is more than ½ inch (1.27 cm), loosen the four baseplate mounting bolts, tighten the two baseplate adjusting screws and then the mounting bolts.

When necessary, adjust the sealed bearing brackets to tighten the chains between the shaft and head sprockets. This operation will slacken the reducer output chain which will then require re-adjustment of the baseplate.

MECHANICAL STOPS

The lower stop (Figure 7) is adjusted so that the geometric centre of the sample chamber corresponds with that of the source assembly when the drawer is lowered to the irradiating position. Because of the wear on chains and the stop this position should be checked once a year. When the drawer is in the irradiating position the V-groove

near the top of the drawer top should line up with the top surface of the inner head plug. The manual crank should be used to position the drawer, then the threaded stop adjusted to suit.

The upper stop should be adjusted so that the sample chamber door is easily removed. It is initially adjusted to position the chamber door sill approximately ¼ inch (0.64 cm) above the inner plug top surface.

CHAMBER DOOR

If the locking ring is difficult to move, the plunger may be adjusted by turning it inward.

ELECTRICAL —

Microswitches

There are nine microswitches on the unit:

S4 — bracket mounted on the left collar door (see Figure 9), the switch is actuated by the right door when the collar doors are closed.

S5 — mounted adjacent to S4, the switch lever drops into a slot in the locking ring when the ring is properly closed.

S6 — mounted adjacent to S4 and S5, the switch is actuated by the sample chamber door.

S7 — mounted on an adjustable bracket on the right side head sprocket, the switch is cam operated to remove the supply to the motor before the end of drawer downward movement. If the drawer fails to reach the irradiating position the mounting bracket should be moved counterclockwise to suit.

S8 — mounted on a bracket adjacent to S11, the switch is cam operated to remove the supply to the motor toward the limit of the drawer upward movement. The switch should operate when the T-bar is approximately ½ inch (1.27 cm) from the upper stop.

S9 — mounted adjacent to the lower mechanical stop the switch is drawer activated approximately ¼ inch (0.64 cm) before end of travel. The switch starts the digital timer.

S10 — mounted on the lower mechanical stop bracket adjacent to S9 the switch removes the motor supply in the event of a failure in S7.

S11 — mounted adjacent to, and connected in series with S8, the switch is provided as a safety feature. Should either S8 or S11 fail the other switch will stop the motor driving the drawer against the upper stop.

S14 — mounted on the top shielding plug the switch activates on the top surface of the drawer top when the shielding plug is closed.

Switches S4, S5, S6 and S14 must be actuated before the motor will operate.

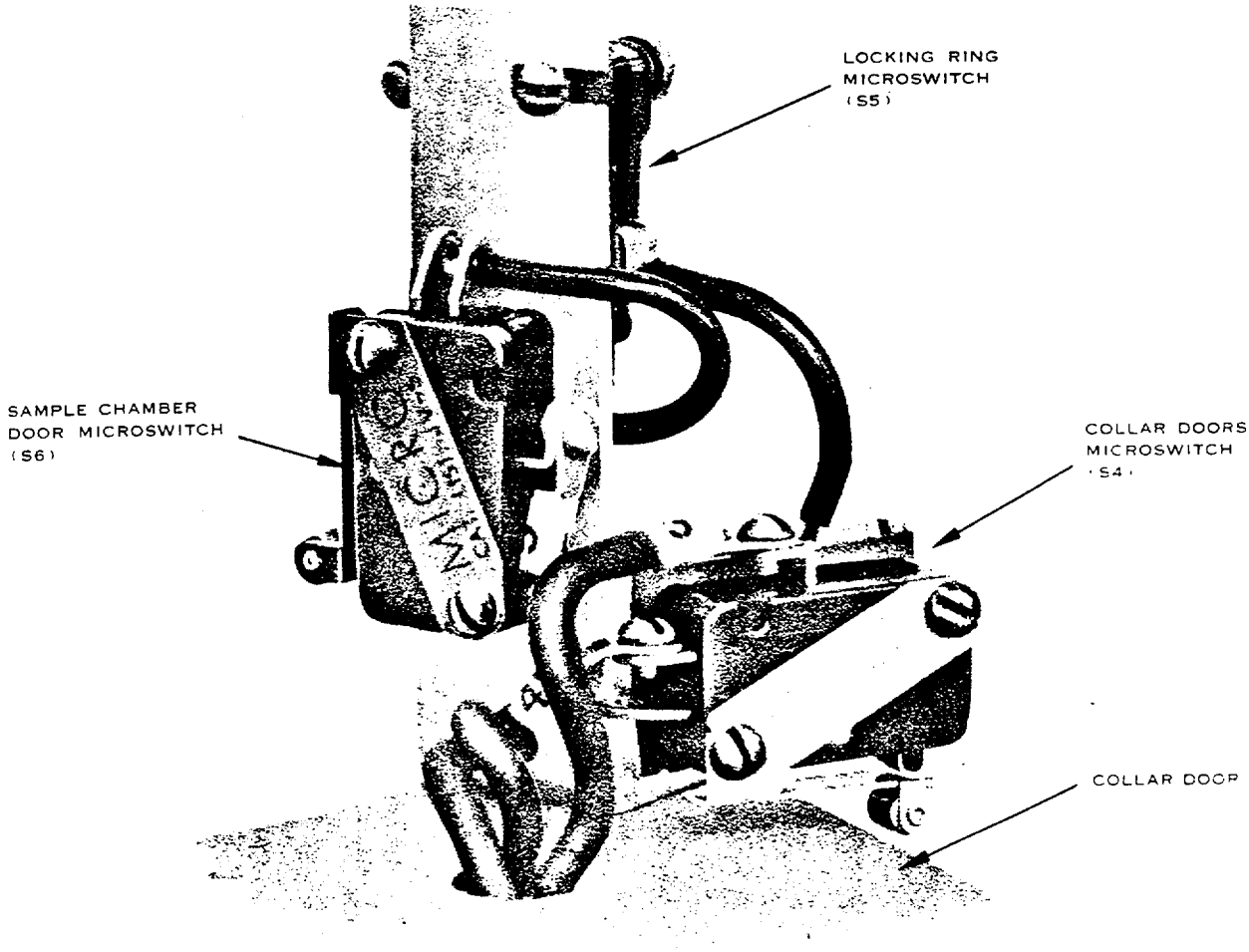
UNIT MOVEMENT

The unit weighs 8,500 pounds (2,630 kg). It is designed for movement by lift truck or overhead crane. If it is necessary to move it after installation the following precautions should be noted:

1. Lift truck — movement should be restricted to short distances over smooth surfaces. The bed or forks of a lift truck will fit under the unit when the step cover has been removed. The drawer must be fully raised; in such a position it has little protection from lateral forces and should not be subjected to shocks or sudden movements.
2. Overhead crane — movement should be made with the drawer in the down position. Remove the two large plug buttons, one on each shoulder, and insert the eye-bolts supplied. Movements should be made with a minimum of shock or vibration.

NOTE: If it is necessary to remove the power supply leads, label each conductor.

If it is necessary to check the phase relation after reconnection, remove the V-belt from the motor and operate the UP switch. The motor should rotate clockwise (as marked). If it rotates counter-clockwise, interchange two of the power leads.

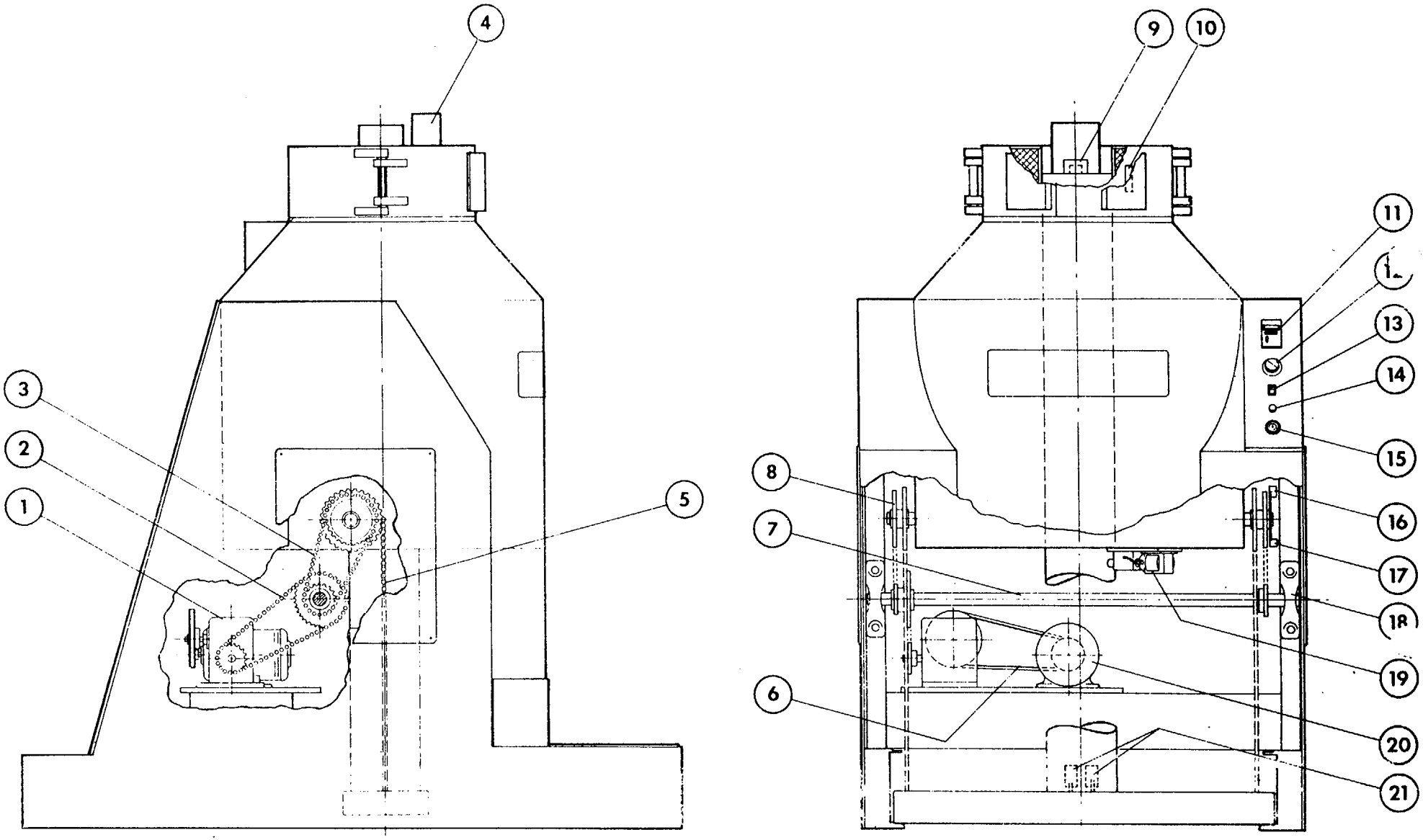


COLLAR MICROSWITCH ASSEMBLY

FIGURE 9

PART 4

COMPONENT LOCATION



COMPONENT LOCATION

PART 5

CONTAMINATION DETECTION

EXCERPT FROM U.S.A.E.C. LICENSE FOR BYPRODUCT MATERIALS

A. *Each sealed source containing byproduct material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be used until tested.*

B. *The tests shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.*

C. *If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Materials Licensing, U.S. Atomic Energy Commission, Washington, D.C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director of the appropriate Atomic Energy Commission Regional Compliance Office listed in Appendix D of 10 C.F.R. 20*

(A list of addresses is enclosed.)

D. *Tests for leakage and/or contamination shall be performed by persons named in Condition 12 of the license or by persons specifically authorized by the Commission to perform such services.*

NOTE:

1. Tests should be made with equipment comparable to the E.A. 147A geiger counter (as used by the Service Department of A.E.C.L.) which has been calibrated to A.E.C.L. standards. With a geometry of approximately 35%, a window of 2.5 milligrams/centimetre squared, and a counting efficiency of 8%, a scale reading of 8,800 counts per minute is equal to 0.05 microcurie of contamination, (see Excerpt B).
2. In countries other than the United States of America, the licensee should adhere to the regulations and conditions dictated by the local Atomic Energy Control Authority.

Removable Contamination Test
For A.E.C.L. Equipment
Containing Cobalt 60 Sources

Wipe Test

The appropriate accessible surfaces of the device (*) in which the Cobalt 60 sources are permanently mounted shall be wiped thoroughly with a piece of filter paper of high wet strength and absorption capacity, which has been slightly moistened with water. The paper is allowed to dry and the radioactivity on the paper is then measured with an appropriate detector. If the measurement indicates the total activity removed to be less than 0.0005 micro-curie the result is described as negative, i.e. no removable contamination is detected.

* Or "source capsule".

Note On Measurement

Tests are made with equipment comparable to the E.A. 147A geiger counter (as used by the Service Department of A.E.C.L.) which has been calibrated to A.E.C.L. standards. (See Note 1, Excerpt from U.S.A.E.C. License for Byproduct Materials).

The above wipe test procedure is conducted by A.E.C.L. prior to shipment of the unit.

Routine Wipe Contamination Test

Method

1. To ensure that there is no loose contamination, two wipe tests will be taken on the machine using 3 inch filter paper of high wet strength moistened with water.
   (a) With the drawer in the load position, wipe the exposed outside surface of the irradiation chamber.
   (b) With the drawer in the irradiate position, wipe all of the exposed lower surface of the drawer for a distance of 12 inches (30.5 cm.) immediately below the bottom shielding.
2. Allow the paper to dry.
3. Count the wipes by placing in contact with a geiger counter operating in a background of no more than 100 counts per minute.
4. If the count recorded is more than 100 counts per minute above background, report by mail to:

   Atomic Energy of Canada Limited,
   P.O. Box 93,
   OTTAWA, Ontario.

   If the count recorded is more than 8,800 counts per minute above background, (0.05 micro-curies of removable contamination), suspend operation and advise the appropriate licensing body and A.E.C.L. Refer Section C of "Excerpt from U.S.A.E.C. Licence for Cobalt 60".
5. The frequency of the above routine will be governed by the appropriate State or Federal Government Agency, but in any case it is recommended that it be carried out at least once every six months.

USAEC REGIONAL OFFICES

HEAD OFFICE

Director,
Division of Materials Licensing
U.S. Atomic Energy Commission,
Washington, D.C., 20545

REGIONS	OFFICE ADDRESS	TELEPHONE No.
Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.	Region I, Division of Compliance, USAEC 970 Broad Street Newark, New Jersey 07102	201-645-3960 * 201-645-3960
Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Panama Canal Zone, Puerto Rico, South Carolina, Tennessee, Virginia, Virgin Islands, and West Virginia.	Region II, Division of Compliance, USAEC Suite 818, 230 Peachtree St. NW. Atlanta, Georgia 30303	404-526-4537 * 404-526-4537
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.	Region III, Division of Compliance, USAEC 799 Roosevelt Road Glen Ellyn Illinois 60137	312-858-2660 * 312-858-2660
Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.	Region IV, Division of Compliance, USAEC 10395 West Colfax Avenue Denver, Colorado 80215	303-297-4122 * 303-237-5095
Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington and U.S. territories and possessions in the Pacific.	Region V, Division of Compliance, USAEC 2111 Bancroft Way Berkeley, California 94704	415-841-5121 * 415-841-5121

* Nights and Holidays