NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 6/9C/35

This is to certify that the pattern and variant of the

Avery Weighing Instrument Model 3205 CLE/8621

submitted by Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163,

have been approved under the Weights and Measures (Patterns of Instruments) Regulations as being suitable for use for trade.

Pattern: (approved 13/6/74):

. platform weighing instrument of 1000 kg capacity with optical encoder and Type 8621 digital indicator.

Variants (as described in Technical Schedule):

1. With different numerical indicating elements (approved 13/6/74);

2. optical encoder with other specified capacities (approved 13/6/74);

3. with unit weights (approved 13/6/74);

4. with digital indicator Type 8621 MP (approved 4/7/78);

5. with hopper lever basework(approved 24/10/75);

6. with other forms of dial housing (approved 13/6/74);

7. with other Commission-approved baseworks (approved 4/7/78).

Variation No 1: approved 28/9/79

8. Hopper basework with Hottinger Z6H 100 kg load cell and Avery 8650 mass indicator displaying up to 1001 increments.

The pattern and variants are described in Technical Schedule No 6/9C/35 and Variation No 1 issued on 28/5/79 and 2/10/79, and in

drawings and specifications lodged with the Commission.

Instruments conforming to Variant No 5 are subject to a six-monthly service period.

The approval is subject to review on or after 30/9/84, with the exception of Variant No 7, which is subject to review on or after 30/9/80.

All instruments conforming to this approval shall be marked with the approval number "NSC No 6/9C/35".

This Certificate replaces Certificate No 6/9C/35 issued on 28/5/79, which may be destroyed.

Signed

Executive Director

2/10/79

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/9C/35

Pattern: Avery Weighing Instrument Model 3205 CLE/8621

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Date of Approval: 1 May 1979

This Technical Schedule replaces Technical Schedule No 6/9C/35 dated 12 July 1974 and Technical Schedule No 6/9C/35 - Variation Nos 1 and 2 dated 23 December 1975 and 24 July 1978, which are hereby cancelled.*

All instruments conforming to this approval shall be marked "NSC No 6/9C/35".

Description of Pattern:

The pattern (Figure 1) is a self-indicating platform weighing machine of maximum capacity 1000 kg by 1 kg scale intervals. It comprises a basework and pillar headwork fitted with a CLA spring-resistant mechanism (known as a CLE headwork) with an optical encoder and Type 8621 digital encoding and display unit (Figures 2 and 3 — Note: Figure 3 does not show the correct markings which are described below.)

The basework pullrod connects through a single intermediate lever to the main headwork lever, to which are connected the balance weight, zero adjustment and oil dashpot (Figure 9).

The spring-resistant mechanism is mounted in the dial housing on top of the pillar. The pullrod from the main headwork lever is coupled through a lever to the rack and pinion which drives the indicator (Figure 10). This mechanism is suitable only for dials with up to

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* Figures 6/9C/35 - 1 to 8 dated 12 July 1974 form part of this Schedule and should be retained.

The texts of Technical Schedule No 6/9C/35 and its Variations may be destroyed.

1000 scale intervals.

The optical encoder comprises a glass disc, marked with a 1000 scale-interval gray code, mounted directly on the indicator shaft and pinion assembly. The glass disc, which turns with the weight indicator, passes between a light and a series of photo-cells which read the encoded mass data from the disc.

The digital display converts the information from the optical encoder and displays it in decimal form on a nixie tube indicator (Figure 4). A motion detector monitors the output mass information available for peripheral equipment. A light on the digital display unit indicates when the motion detector has closed the output-mass-information gate.

The two-lever system basework (Figures 11 and 12) consists of a long and a short second-order lever coupled by a self-aligning link. The platform is attached to a stool mounted on the four load knife-edges.

Markings:

The nameplate is marked with the following data:

Manufacturer's name	
Serial number of instrument	
NSC approval number in the form:	NSC No 6/9C/35
Accuracy class in the form:	(III)
Maximum capacity in the form:	Max 1000 kg *
Minimum capacity in the form:	Min 50 kg *
Verification scale interval in the form:	$d_d = e = 1$ kg *

* These markings are repeated on the mass reading faces.

Variants:

1. Seven-segment numerical indicators replacing the nixie tube indicators. The segments may be single filaments or made up of a series of light-emitting diodes (Figure 4). An all-segment test button is provided.

2. Optical encoders with:

   (a) 1000 scale intervals by units of 1, 2 or 5 X 10^n;
   (b) 799 scale intervals by units of 5 X 10^n;
   (c) 600 scale intervals by units of 1 or 2 X 10^n,

   where n is any whole number.

3. Unit weights fitted to the headwork. The digital indicator will display the mass appropriate to the unit weight selected and the mass indicated.

4. A digital display unit Type 8621 MP (Figure 8). A zero light illuminates when the digital mass indicator is within 0,25 scale interval at zero.

5. A hopper lever system (Figures 5 and 6) of capacity up to 30 tonnes. It comprises two main levers constructed from a steel tube with a torsion arm at one end and two shorter arms which carry the fulcrum and load knife-edges (Figure 7). The hopper is supported from the load knife-edges by swinging links. Separate vertical links connect the torsion arms to the transfer lever.

   The hopper is fitted with test-weight receptors allowing an appropriate test load to be located near each main load bearing.

   The instrument may be fitted with various devices to fill and empty the hopper and record mass. These include the headwork with a non-contact-sensing device (photo-cells, proximity switch, etc.) to control peripheral equipment. If the device is able to be "turned off" a check should be made that the indication does not change when the device is turned off.

6. With the CLA mechanism mounted in other forms of cabinet.

7. The baseworks of other Commission-approved patterns replacing the basework described in the pattern, provided that:

   (a) the basework is of an instrument conventionally known as a platform weighing machine, weighbridge or hopper scale, etc., where the headwork and basework are separate assemblies connected by a mechanical linkage;

   (b) the capacity of the instrument is not more than the capacity approved for the basework;

   (c) additional transfer levers may be used;

   (d) a levelling device and a level indicator are fitted, except for instruments installed in a fixed position or instruments which satisfy the accuracy requirements and tilt tests specified in Test Procedures when tilted to a slope of 1 in 20 in a longitudinal direction and a transverse direction;

   (e) if a level indicator is required, its sensitivity shall be

such that, when the instrument is tilted so that the bubble in the level indicator moves 2 mm, the zero will not change by more than two scale intervals, and when zero is reset in the tilted position the instrument will satisfy the accuracy requirements;

(f) the instrument is marked with the following approval numbers:

Headwork NSC No 6/9C/35
Basework NSC No .....

Test Procedures:

1. Tilt tests for other baseworks

(a) Tilting at no-load — the zero indication should not vary more than 2e when tilted to a slope of 1 in 20, the zero being first adjusted in the reference (level) position.

(b) Tilting when loaded — the indication should not vary more than e when tilted to a slope of 1 in 20, the indication at zero being adjusted in the reference position before tilting and in the tilted position before reloading.

2. Accuracy requirements

The application of the test loads specified in Table 1 and the display of these loads within the accuracy requirements listed below will check that the instrument operates in accordance with the approved design.

The maximum permissible errors are:

± 0,5e for loads between zero and 500e inclusive;
± 1e for loads between 501e and 2000e inclusive; and
± 1,5e for loads greater than 2000e.

3. Zero balance -- check by means of the Commission's digital zero test that, whenever the zero light is illuminated, zero is set within 0,25e of zero.*

4. Zero range -- the maximum range of operation of the zero device should not exceed 4% of the capacity of the instrument (± 2% approximately).

* See NSC Design Manual No 1, Document 104, Testing Procedure for the Elimination of Rounding Error for Weighing Instruments with Digital Indication.

5. Range of indication —

(a) the maximum weight indicated should not exceed the maximum capacity (Max); above this indicated weight the digital indicator should be blank;

(b) the minimum weight indicated should be zero; below this indicated weight the digital indicator should be blank.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/9C/35

VARIATION No 1

Pattern: Avery Weighing Instrument Model 3205 CLE/8621

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Description of Variant:

8. The hopper lever system (Variant No 5) with a Hottinger Z6H 100 kg load cell replacing the fulcrum pedestal of the intermediate lever of the cabinet (Figures 13 and 14). The output voltage from the load cell is converted to a digital mass indication of up to 1001 increments in an Avery 8650 mass indicator (Figure 15). This replaces the optical encoder and Type 8621 digital encoding and display unit. The transfer lever remains connected through a pullrod to the Avery CLA spring-resistant mechanism which indicates mass on the dial of capacity 10,01 tonnes by 0,01 tonne scale intervals.

The reading faces are marked:

Analogue Dial:		Digital Indicator:	
Max	10,01 t	Max	10,01 t
Min	0,50 t	Min	0,50 t
d = e =	0,01 t	d_d = e =	0,01 t

Test Procedure:

Accuracy Requirements

The maximum permissible errors are:

± 0,5e for loads between 0 and 500e;
± 1e for loads between 501e and 2000e.

Also, the difference in reading between the analogue and digital indicators shall not exceed 0,5e or 1e respectively, depending on load.

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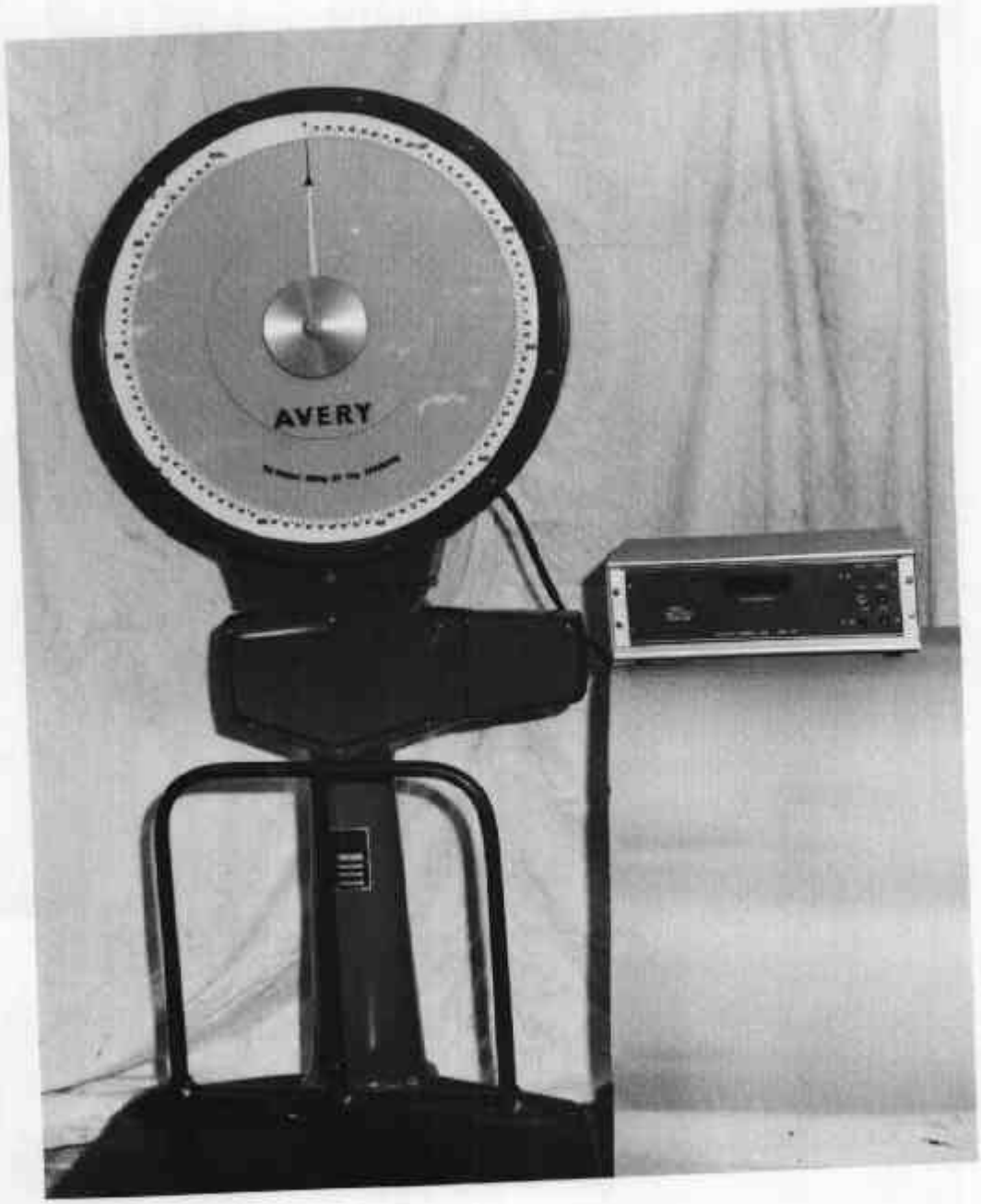
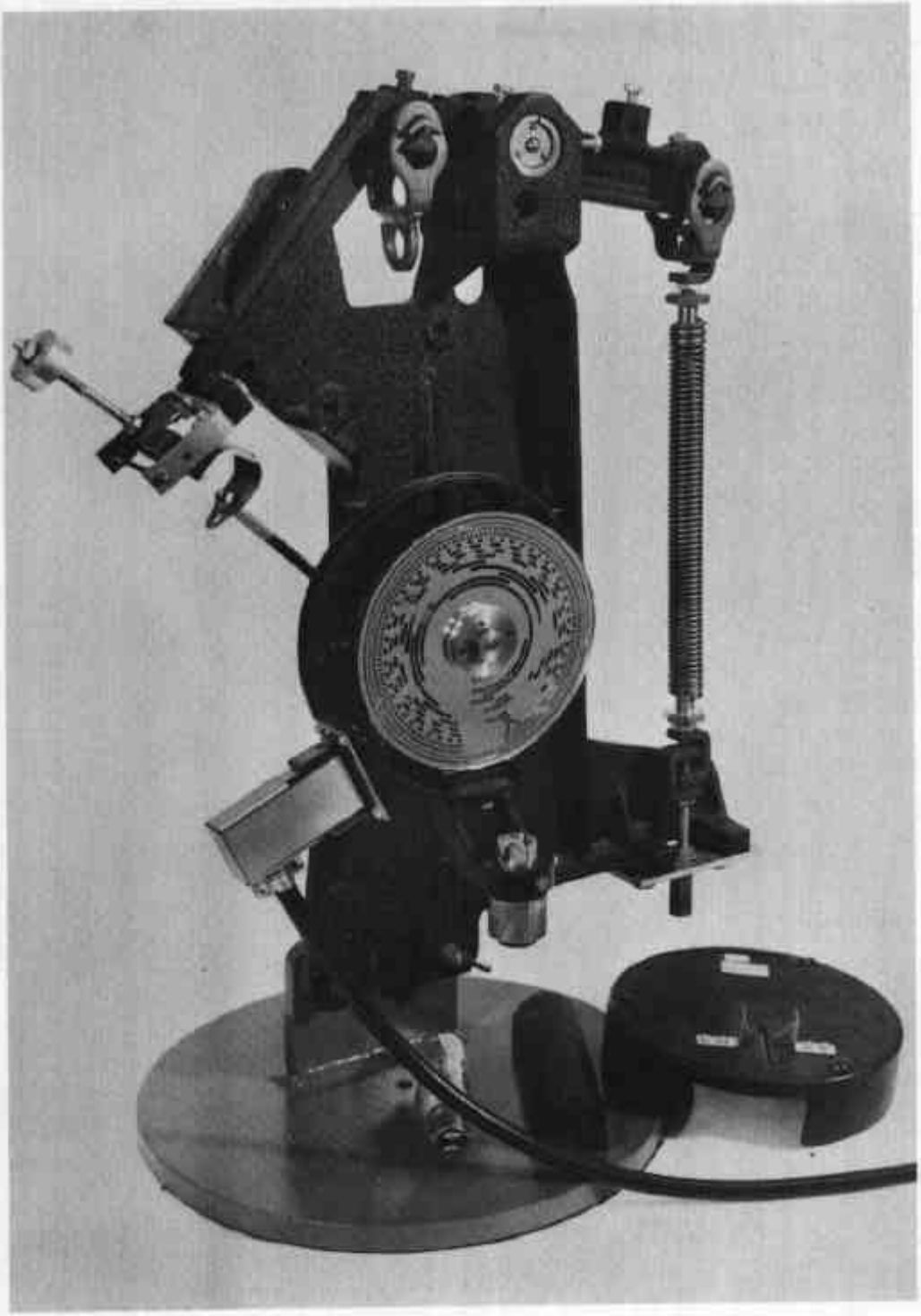
FIGURE 6/9C/35 - 1



Avery Platform Weighing Machine
with Digital Encoding System

12/7/74

FIGURE 6/9C/35 - 2



Optical Encoder — Cover Removed

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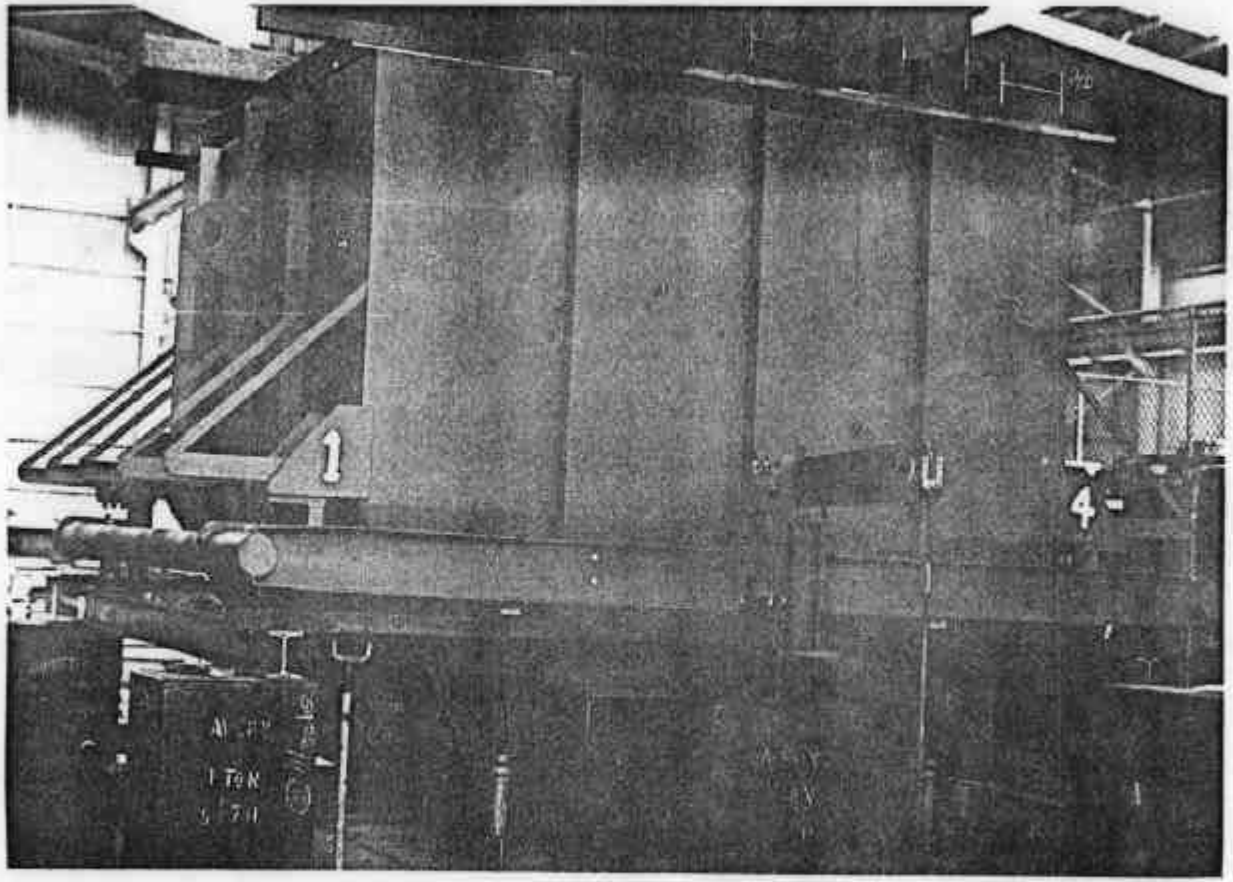
FIGURE 6/9C/35 - 3

Digital Display Unit with Seven-bar Indicator

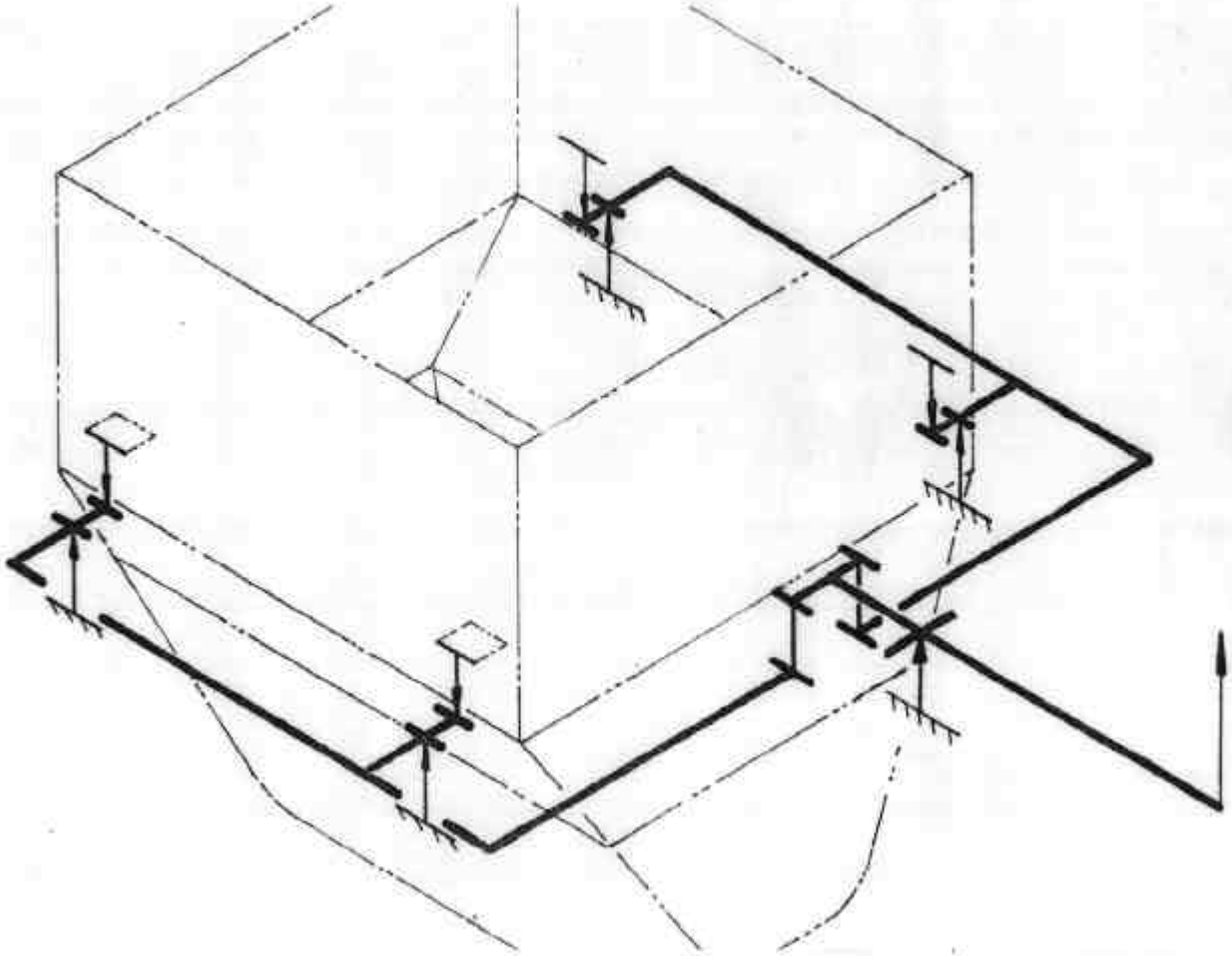
23/12/75

FIGURE 6/90/35 - 5



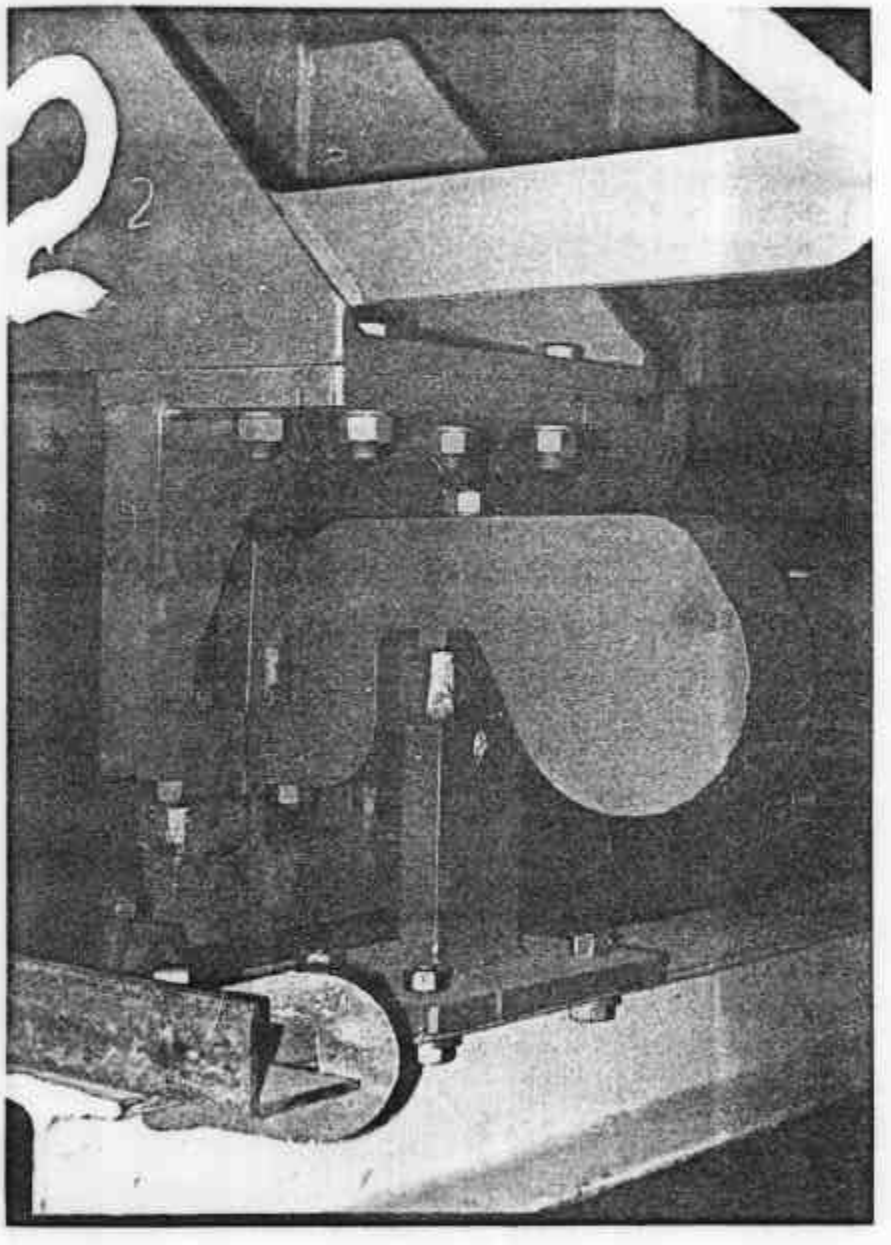
Hopper Lever System

FIGURE 6/90/35 - 6



Hopper Lever System — Schematic Drawing

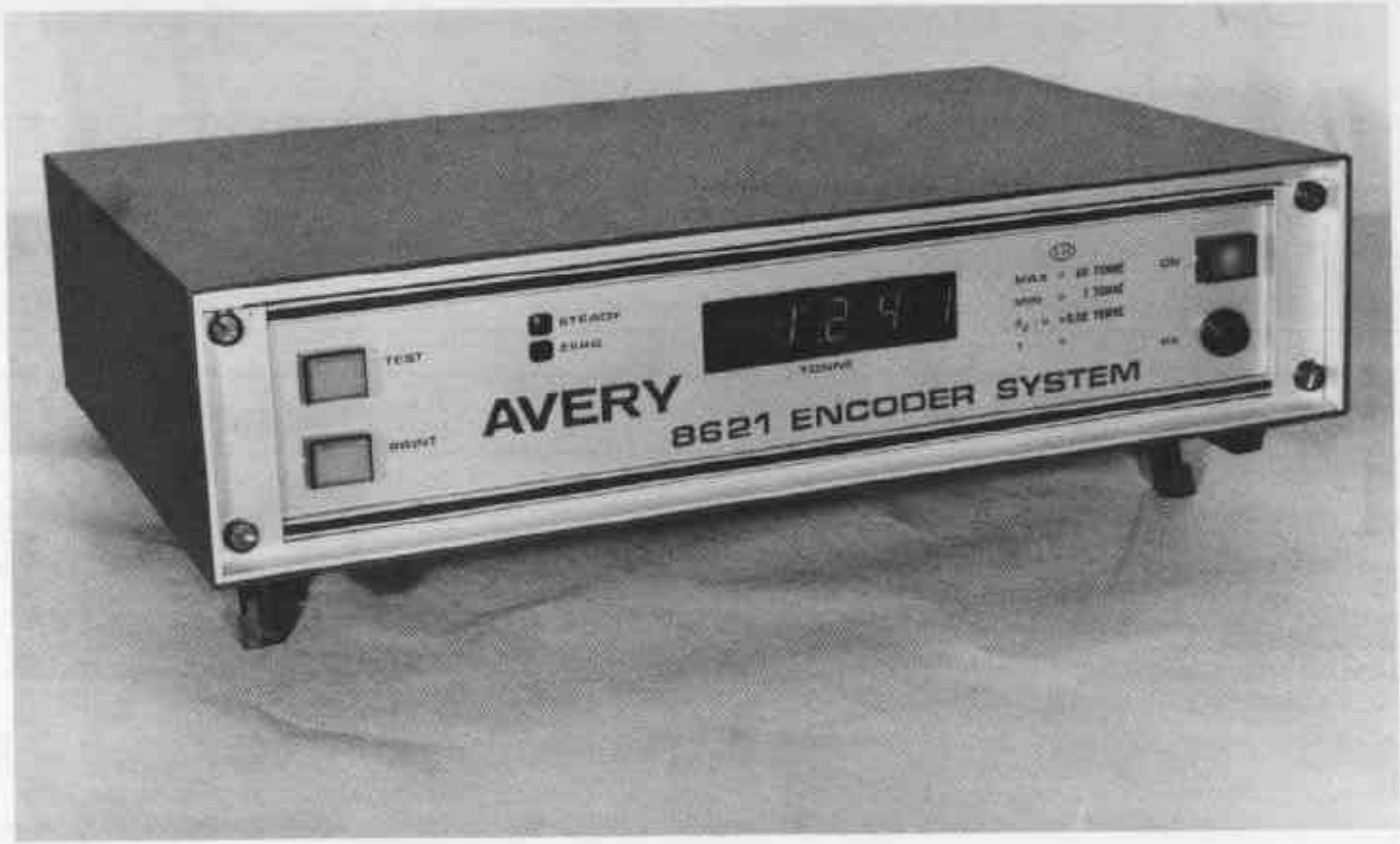
FIGURE 6/90/35 - 7



Fulcrum Stand and Swinging Link

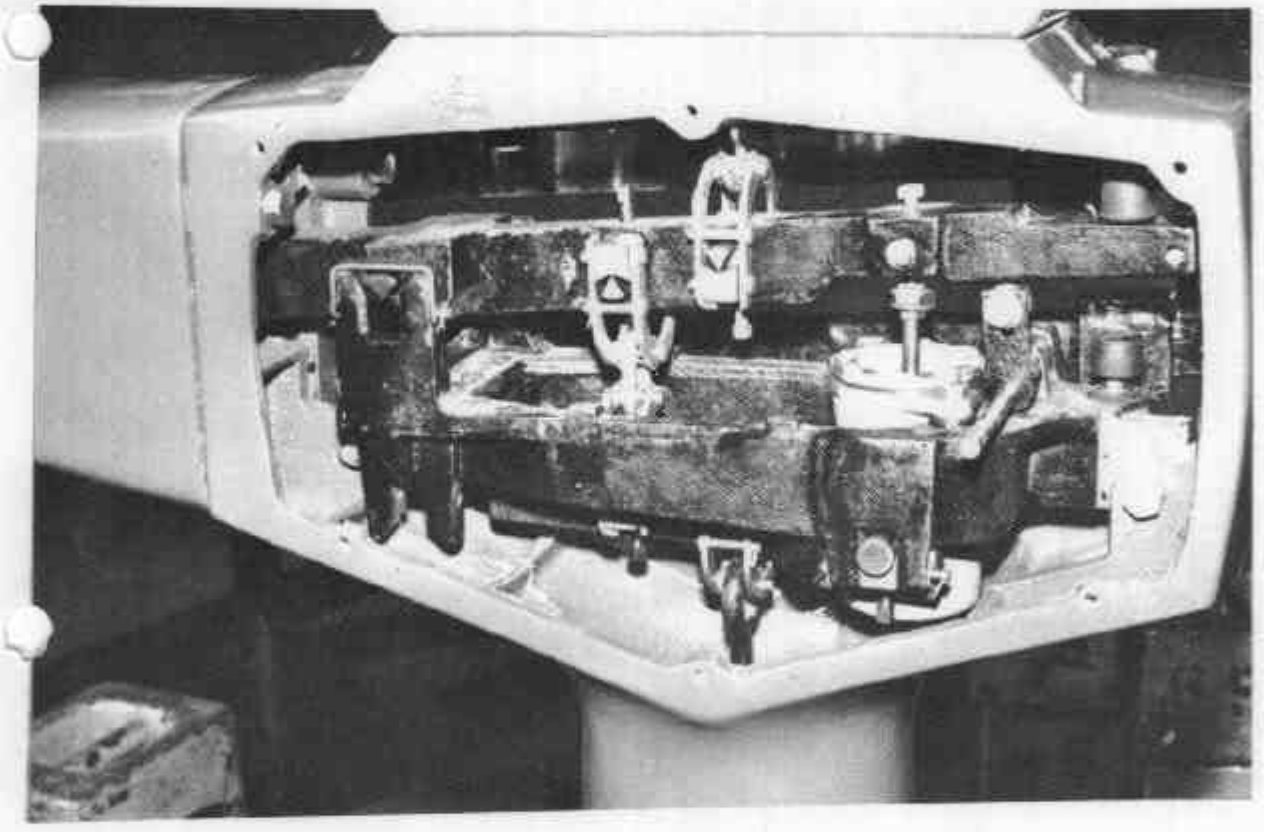
23/12/75

FIGURE 6/9C/35 - 8



Weight Indicator Type 8621 MP

FIGURE 6/9C/35 - 9



Pillar Headwork Levers (back view)

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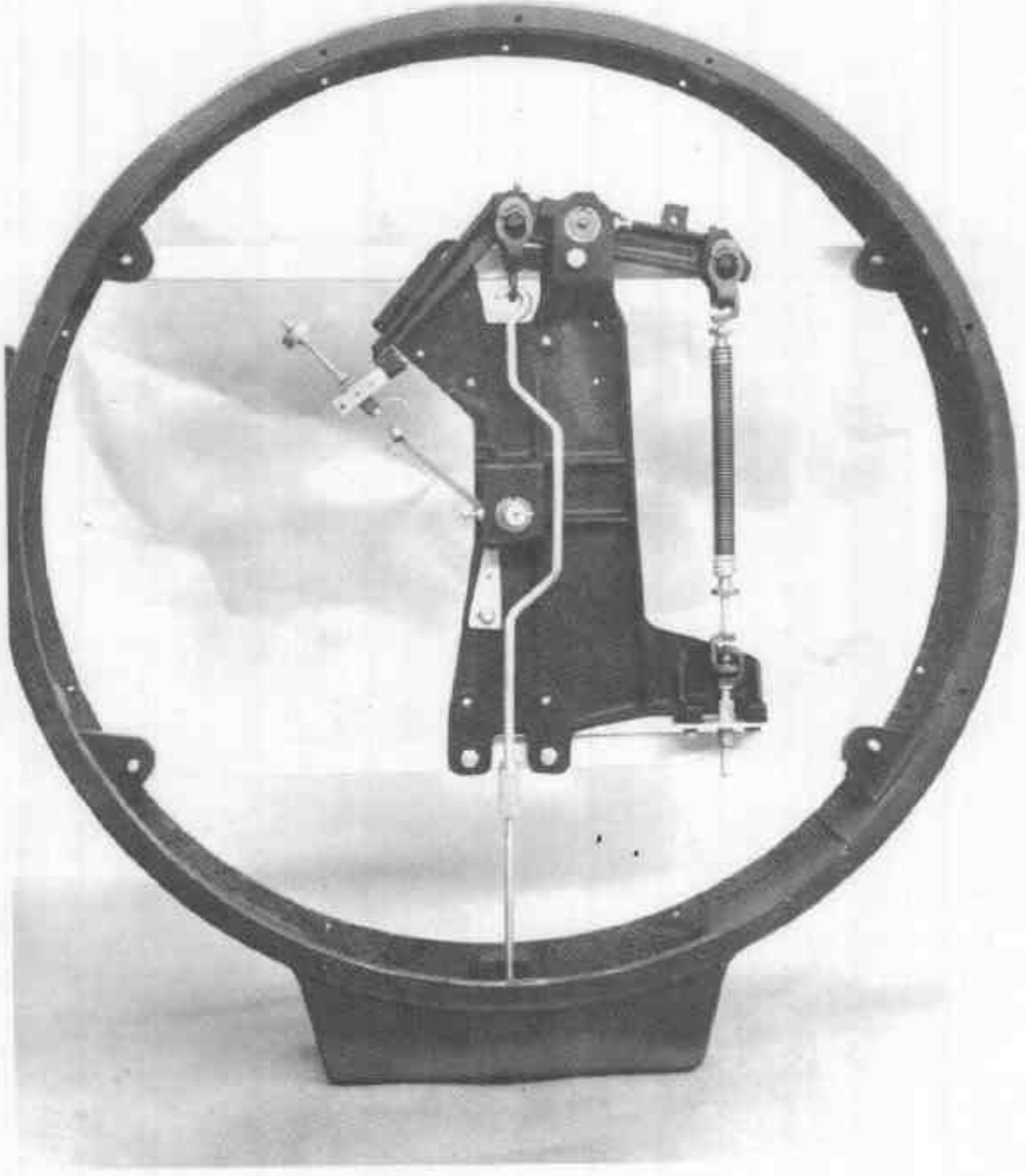
FIGURE 6/9C/35 - 10



CLA Spring-resistant Mechanism

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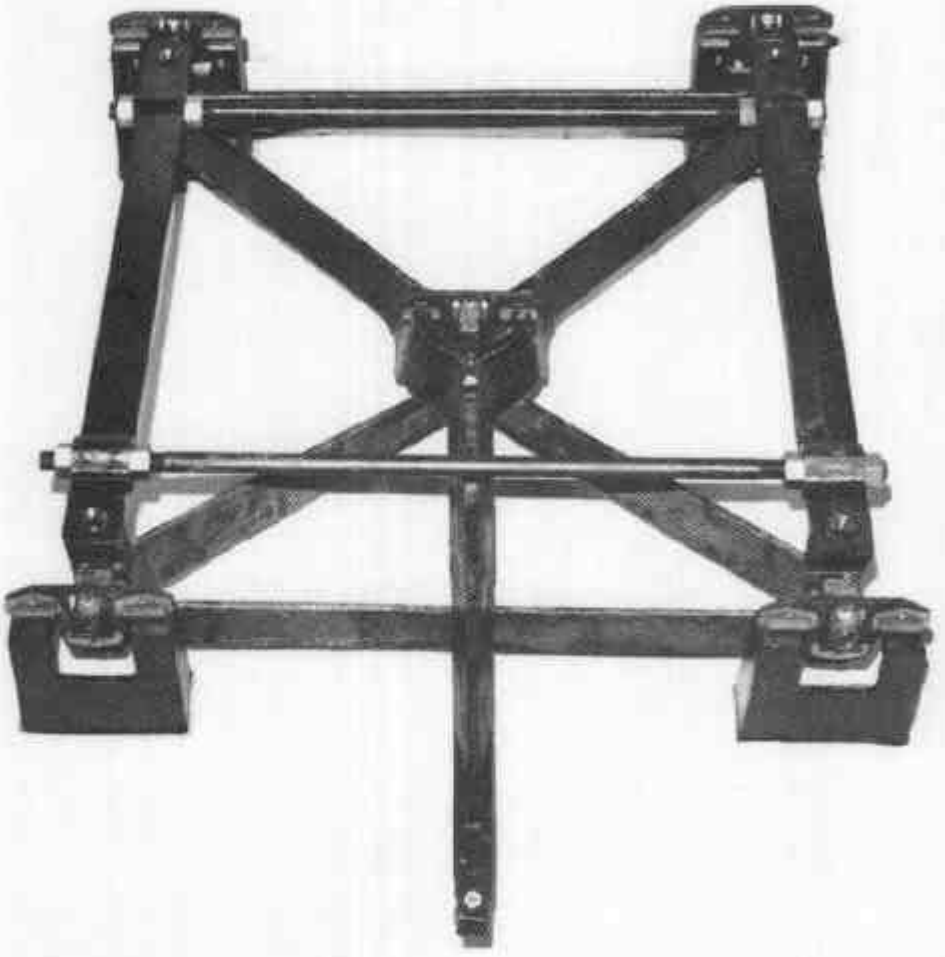
FIGURE 6/9C/35 - 11



Two-lever System

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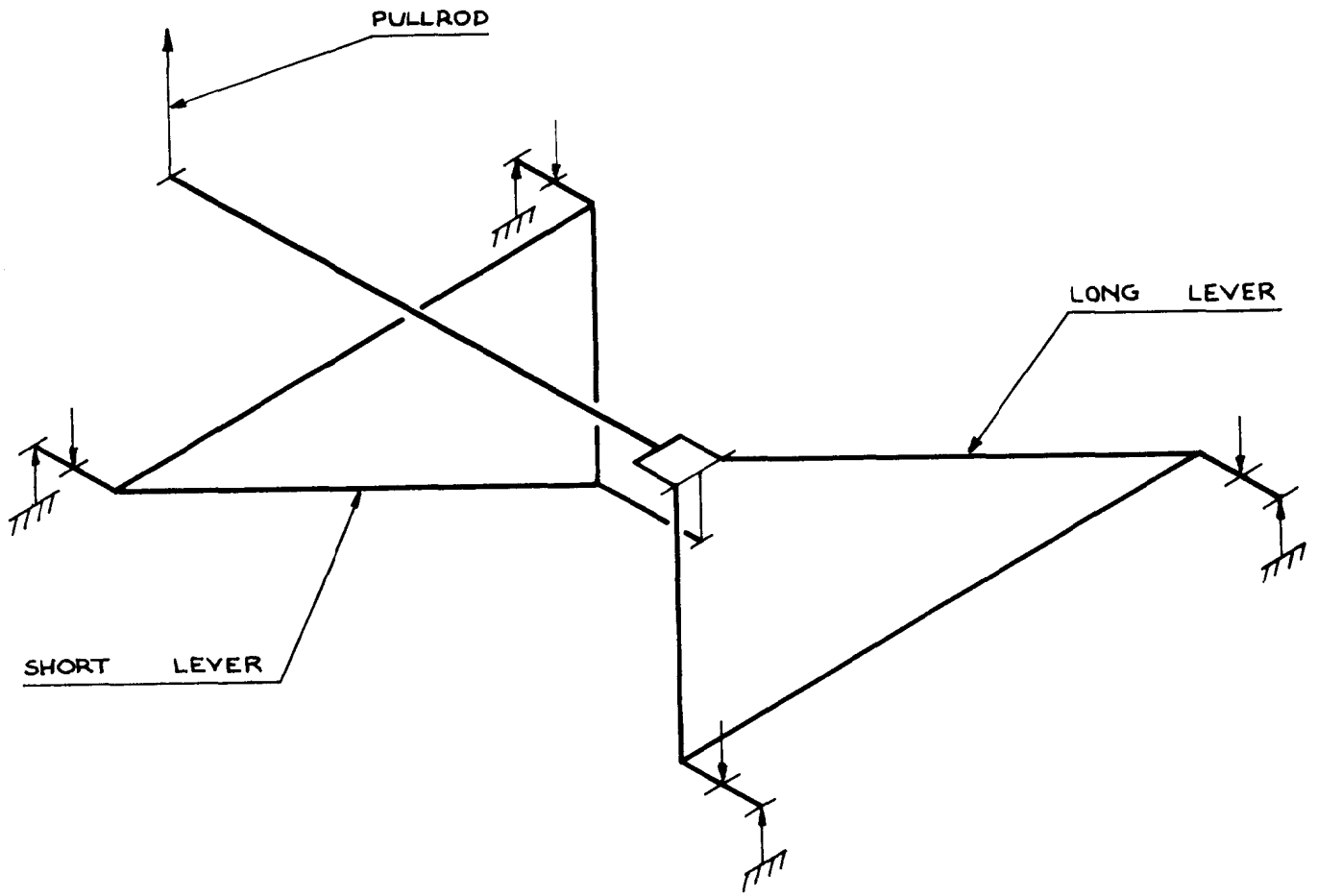
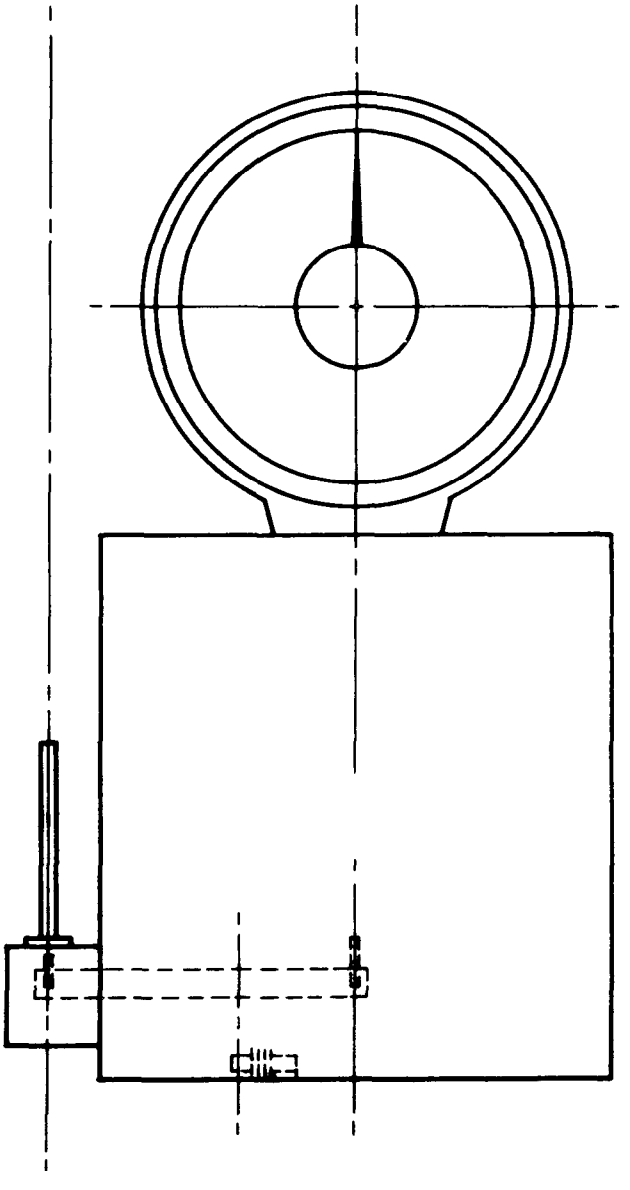


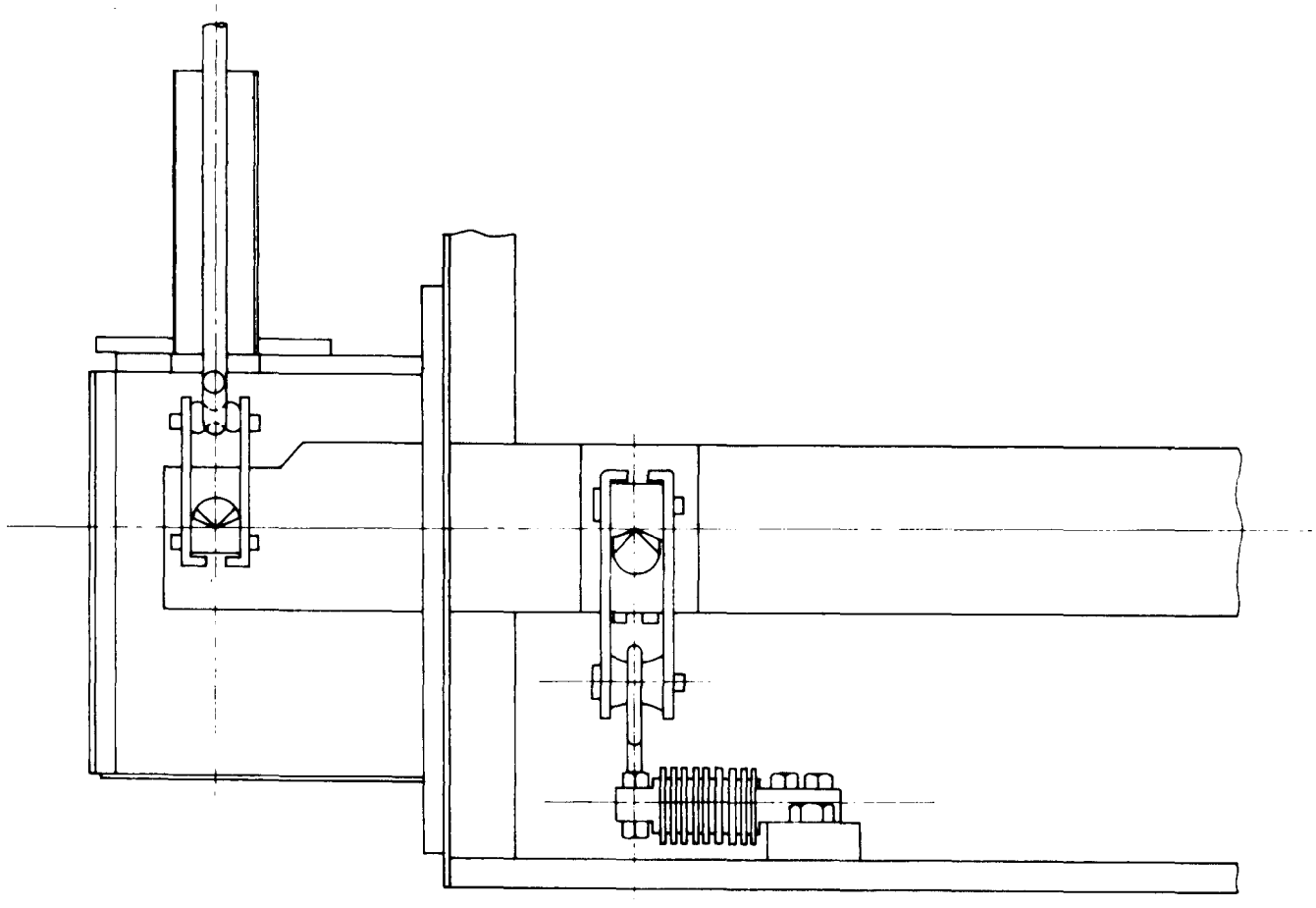
Two-lever System — Lever Diagram

FIGURE 6/9C/35 - 13



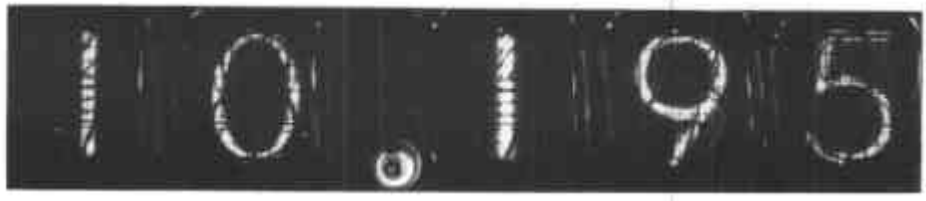
Headwork fitted with Hottinger Load Cell —
Schematic Diagram

2/10/79



Intermediate Lever with Load Cell

FIGURE 6/9C/35 - 4



Nixie-tube

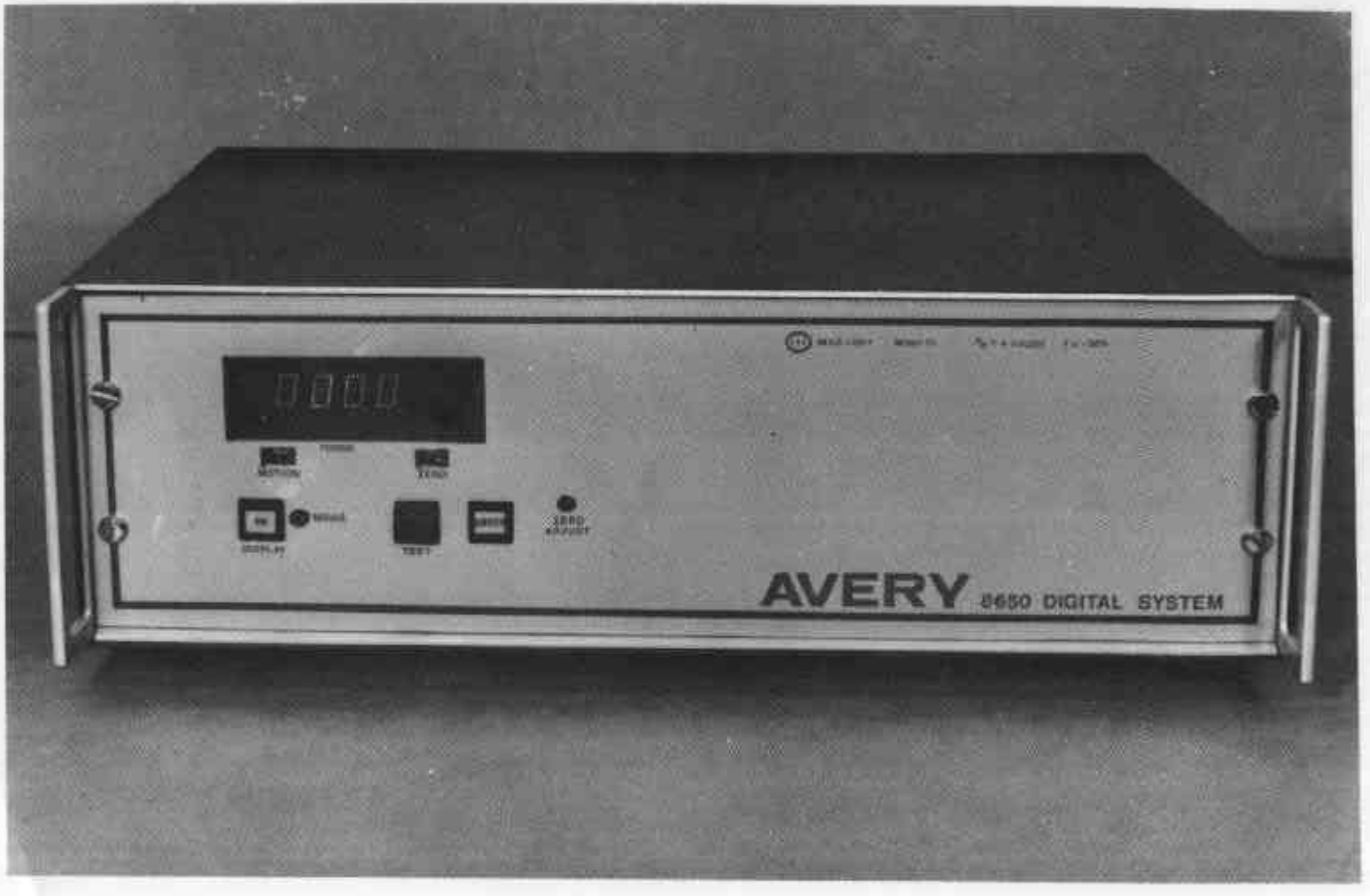
Single-filament

Light-emitting Diode

Digital Weight Indicators

12/7/74

FIGURE 6/9C/35 - 15



Avery Mass Indicator 8650