

VARIATION No 1

This is to certify that the following modifications of the pattern and variants of the
Howe Richardson Self-indicating Weighing Instrument

approved in Certificate No 6/9C/4 dated 28 April 1972

submitted by Howe Richardson Scale Co. Pty Ltd, Denney Street, Broadmeadow,
New South Wales, 2292,

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

The approved modifications are:

1. the one instrument Serial No 9060 located at the A. P. M. Mill, Maryvale,
Victoria, fitted with:
 - (a) an AR3 digital transmitter and digital indicator; and
 - (b) a basework with two three-lever systems and a capacity of 9200 lb; and
2. converting all weighing instrument models to indicate in metric units in
accordance with Appendix 8 of the General Specifications for Measuring
Instruments to be Used for Trade.

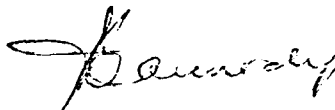
Approval was granted on 17 May 1974.

This variation is described in Technical Schedule No 6/9C/4, Variation No 1, and
in drawings and specifications lodged with the Commission.

The approval is subject to review on or after 1 June 1979.

All instruments conforming to this approval shall be marked with the approval
number "NSC No 6/9C/4".

Signed



Executive Officer

Indexed

17/5/74



COMMONWEALTH OF AUSTRALIA

NATIONAL STANDARDS COMMISSION

Weights and Measures
(National Standards)
Act 1960-1966

Weights and Measures
(Patterns of Instruments)
Regulations

Certificate of Approval

CERTIFICATE NUMBER 6/9C/4

This Certificate replaces Certificate No 6/9C/4 dated 16th February 1970. *

In respect of the pattern of

Howe Richardson Self-indicating Platform Weighing Machine and Variants.

Submitted and

manufactured by:

Howe Richardson Scale Co. Pty. Ltd.,
Ailsa Road and Denney Street,
Broadmeadow,
New South Wales. 2292.

This is to certify that the pattern and variants of the instrument illustrated and described in this Certificate have been examined by the National Standards Commission under the provisions of the abovementioned Regulations and have been approved as being suitable for use for trade.

The pattern and some variants were approved on 19th October 1966 for a limited duration expiring on 31st December 1969. Further variants were approved on 19th October 1966, 19th February 1969, 10th February 1970 and 17th April 1972 (see Figure 19).

Approval was granted on condition that:

1. all instruments conforming to this Certificate:
 - (a) are appropriately marked NSC No 6/9C/4; and.

* NOTE: Figures 6/9C/4 - 1 and 3 to 12 of the previous issue form part of the Certificate and must be retained.

where required by State legislation, with the State approval number also; and

(b) comply with the General Specifications for Measuring Instruments to be Used for Trade in respect of that part of the instrument which was not previously approved by a State;

2. variant 1 is limited to the instrument fitted with a nameplate marked:

"Howe Richardson Scale Co
Rutland Vermont
Model No 31000
Serial No 6602310".

This Certificate comprises:

Pages 1 to 7 dated 28th April 1972.

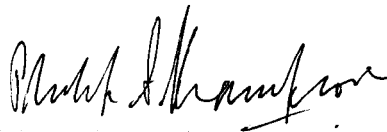
Figures 6/9C/4 - 1 and 3 to 12 dated 16th February 1970.

Figures 6/9C/4 - 2, and 13 to 19 dated 28th April 1972.

Pursuant to regulation 12 of the abovementioned Regulations, this Certificate is applicable in all States in respect of Component No 20.

Date of issue 28th April 1972.

Signed



A person authorized by the Commission to sign Certificates under the abovementioned Regulations.

DESCRIPTION OF PATTERN

The pattern (see Figure 1) is of a self-indicating platform weighing machine of 13 000-lb capacity and comprises the components tabulated in Column 5 of Figure 19. The capacity includes 9 unit weights each equal to 1000 lb and two tare bars with a capacity of 2800 lb. The dial is graduated to 1200 lb x 2-lb graduations.

DESCRIPTION OF VARIANTS

The components tabulated in Columns 6, 7, 8, 9 and 10 of Figure 19 make up variants of the pattern with capacities up to the capacities of the lever system described in Components Nos 1, 2 and 3.

DESCRIPTION OF COMPONENTS

1. Three-lever system up to 15 000-lb capacity (see Figures 2, 3 and 4) — comprises two second-order main levers longitudinally positioned and supported on four fulcrum stands attached to a frame and fitted with self-aligning bearings. The nose-end of each main lever is coupled to a second-order transfer lever which in turn is coupled to the headwork pullrod (see Figures 3 and 4). The platform is supported on four ball-bearing suspension units fitted with self-aligning bearings (see Figures 2 and 3). The lever knife-edges are mounted between two side-plates.
2. Two-lever system up to 8000-lb capacity (see Figures 10 and 11) — comprises two second-order main levers similar to Component No 1, except that they are transversely positioned and the nose-ends are coupled together and an extension fixed to one lever is coupled to the headwork pullrod.
- *3. Three-lever system of 5725-lb capacity (see Figure 9) — comprises two second-order main levers similar to Component No 1, except that each fulcrum and suspension knife-edge is double-cantilevered through a single plate. The platform support is also similar to that in Component No 1, except that the self-aligning bearings are fitted to a yoke which straddles the single plate.

* Limited to one instrument, Serial No 6602310.

28/4/72

4. Transfer levers — the headwork may be located in any reasonable position in relation to the basework, in which case more than one transfer lever may be fitted, provided all are fully protected.
5. Headwork cabinet with no unit weights — the basework pullrod is coupled to the main headwork lever of the cabinet as described in Certificate No 6/9C/3.
6. Headwork cabinet (see Figures 5, 6 and 7) with manual unit-weight selector — the basework pullrod is coupled to the main headwork lever to which is attached:
 - a zero adjustment accessible through a shutter-covered opening in the side of the cabinet;
 - two oil dashpots;
 - a locking device which is operated by turning a hand lever on the front of the cabinet;
 - a covered balance weight;
 - a system of unit weights operated manually. This is a mechanism (see Figures 5 and 6) by means of which up to four weights are deposited on or removed from the lever, either individually or in combinations by means of cams mounted on a shaft; this provides up to nine ranges in increments of 80% or more of the dial capacity. The camshaft is operated through gears by means of a hand crank located at the front of the cabinet. The flash dial is rotated by the unit-weight selector mechanism through a bowden cable (see Figure 7) to display the appropriate weight values through each of the apertures in the main dial.
7. Headwork cabinet (see Figures 13, 14 and 15) with automatic unit-weight selector — up to four weights are deposited on or removed from the main headwork lever, either individually or in combinations to provide up to nine ranges in increments of 80% or more of the dial capacity. When the load reaches approximately 95% of the dial capacity a magnet located on the main headwork lever actuates a switch (see Figure 14). This

energizes the motor-starting relay which runs a reversible motor in the direction to deposit extra weights. The motor drives a shaft fitted with cams which, acting through pivoted arms, deposit weights on the main lever. When the necessary weights have been added to counterbalance the load, the return of the main lever towards the central position opens the lever-actuated switch. When the mechanism reaches a position where the weights are fully engaged, a positioning switch (see Figure 15) operated by a cam on one of the drive sprockets opens and stops the motor through the relay. A second magnetically actuated switch starts the motor rotating in the reverse direction when the load reaches a point representing approximately 5% of the dial capacity, thus removing the weights.

A rack driven by a pinion attached to the main spur-gear driving shaft operates two limit switches (see Figure 15). These prevent further rotation when all the weights have been deposited on or removed from the main lever. The weights may, if necessary, be deposited manually; an emergency crank handle is provided which may be attached to the unit-weight mechanism drive shaft after removing a protective cover; the crank handle must be in the lower vertical position when weighing.

Bowden cables are used to change the indications of the flash dial in synchronism with the deposited weights. The cables are operated by a rack and pinion drive from the camshaft (see Figure 15).

- *8. Circular dial and flash dial (see Figure 1) — the weight denominations and digits on the dial and the digits on the flash dial are radially orientated.
9. Circular dial and flash dial (see Figures 16 and 17) — the weight denominations and digits on the main dial and the digits on the flash dial are horizontally orientated. The flash dial revolves on four adjustable rollers on its inner circumference. The bowden cable from the unit-weight mechanism extends over a fixed pulley and is attached to a circular guide bracket fixed to the dial. A return spring is fitted between the bracket and the dial housing.

* Approval expired on 31st December 1969.

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10. Circular dial without a flash dial — the weight denominations and digits are horizontally orientated as described in Certificate No 6/9C/3.
 11. Two dials — similar to those described in Components Nos 8, 9 or 10, are mounted one on either side of the dial housing, in which case no locking device or tare bars are fitted.
 12. Centre-zero dial (see Figure 18) — graduated and marked "under" and "over", in which case no ticket printer or unit weights are fitted.
 13. Double-pendulum tape-drive resistant mechanism — the main headwork lever is coupled through a pullrod which is fitted with an oil seal to a double-pendulum resistant mechanism described in Certificate No 6/9C/3. This mechanism is suitable only for dials with the number of graduations approved in Certificate No 6/9C/3.
 14. Tare bars (see Figure 1) — up to two tare bars are mounted on the main headwork lever.
 15. M-R printer and motion detector (see Figure 12) — the printer and detector are described in Certificate No 6/10B/1. The drive to the printer from the unit-weight mechanism, if fitted, is a bowden cable and chain as shown in Figure 12. When both the automatic unit-weight mechanism and the ticket printer are fitted, electrical interlocks are provided to prevent the automatic changing of unit weights during the printing cycle and, conversely, the operation of the printer while the unit-weight change mechanism is in operation.
 16. Weight-control unit — a photo-electric switch is fitted to the dial indicator, as described in Certificate No 6/10B/1.
 17. Full-capacity steelyard — the steelyard is as described in Certificate No 6/10A/1.
 - *18. Ticket-printing poise — the poise, as described in Certificate No 6/10A/1, is fitted to the full-capacity steelyard in Component No 17.

* Approval expires 30th June 1972.

28/4/72

19. Tare-bar cover (see Figure 8) — two tare bars are housed behind a hinged glass-fronted cover fitted with two key-operated locks.
20. The headworks of any State-approved pattern* or Commission-approved pattern may be fitted to either of the baseworks described in Components Nos 1 and 2.

GENERAL NOTES

This Certificate has been re-arranged since the previous issue dated 16th February 1970 and now includes a compatibility table.

* Pursuant to regulation 12.

28/4/72



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/9C/4

VARIATION No 1

Pattern: Howe Richardson Self-indicating Weighing Instrument

Submitter: Howe Richardson Scale Co. Pty Ltd,
Denney Street,
Broadmeadow, New South Wales, 2292.

Date of Approval of Variant: 17 May 1974

The modifications described in this schedule apply to the pattern and variants described in the following pages and figures of Certificate No 6/9C/4 dated 28 April 1972:

Pages 3 to 7 dated 28 April 1972

Figures 6/9C/4 - 1 and 3 to 12 dated 16 February 1970

Figures 6/9C/4 - 2 and 13 to 19 dated 28 April 1972

Note: The three-lever basework system of 5725-lb capacity is limited to the one instrument Serial No 6602310.

All instruments conforming to this approval shall be marked "NSC No 6/9C/4".

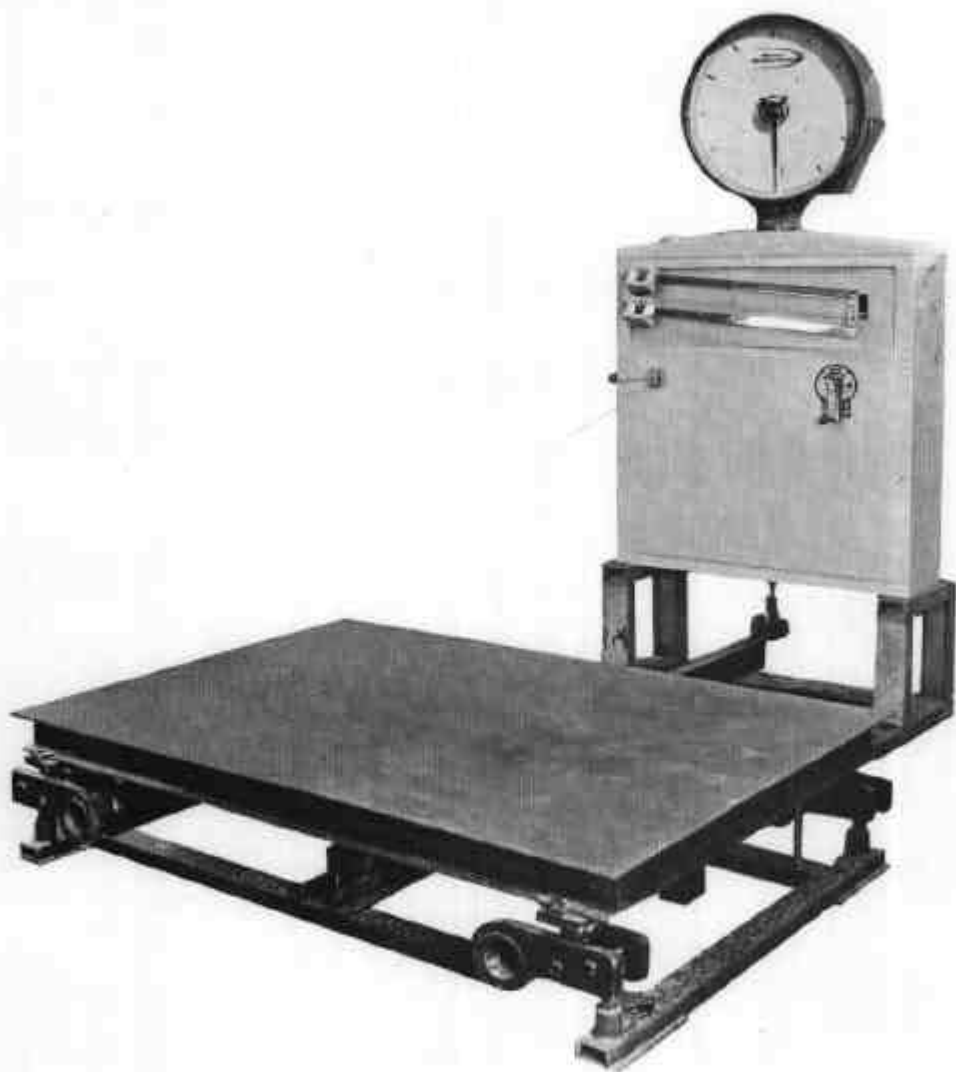
Description:

The approved modifications are as follows:

1. Fitting the one instrument Serial No 9060 located at the APM Mill, Maryvale, Victoria, with
 - (a) Model AR3 digital transmitter and digital indicator (see Figure 20); and
 - (b) a two three-lever-system basework of capacity 9200 lb (see Figure 21).
2. Converting all models to indicate in metric units in accordance with Appendix 8 of the General Specifications for Measuring Instruments to be Used for Trade.

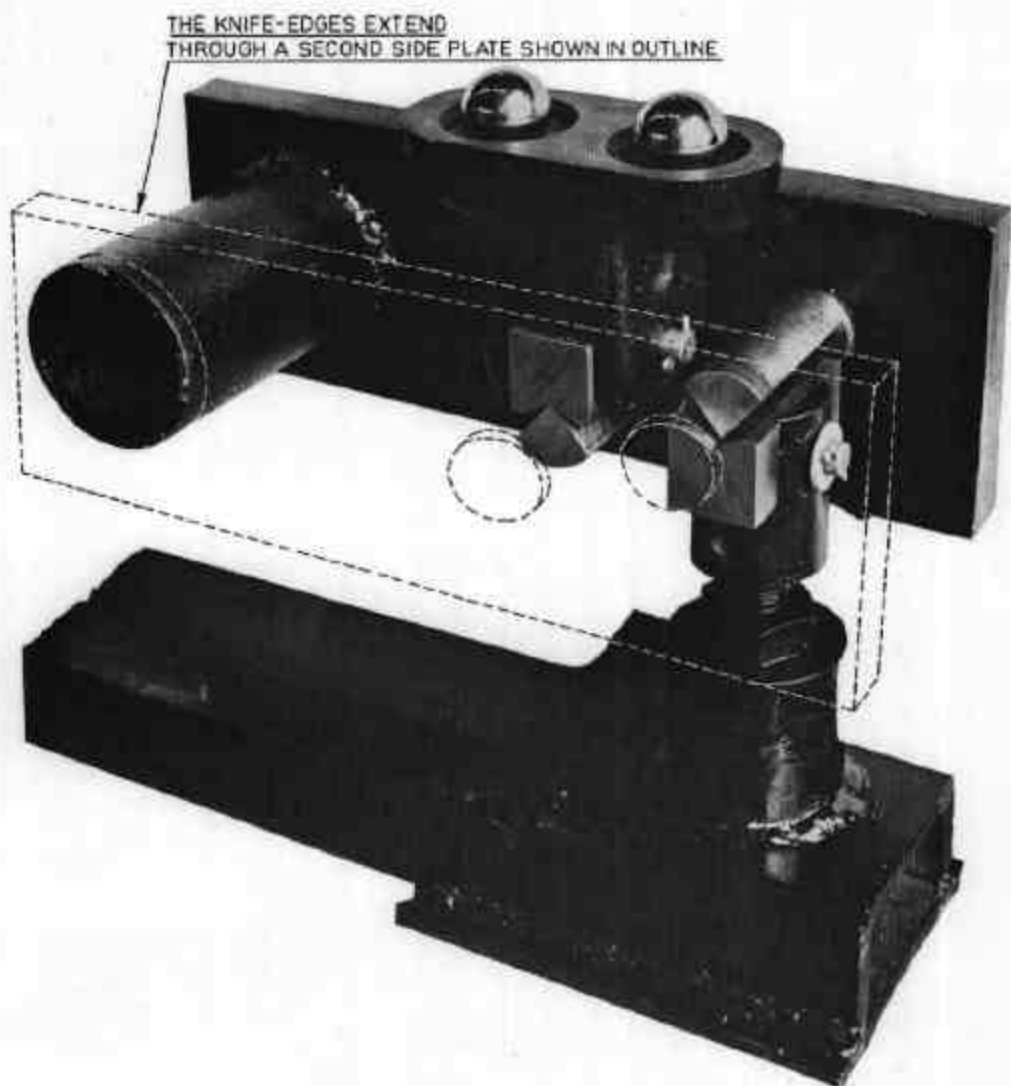
29/5/74

FIGURE 6/9C/4 - 1.



Howe Richardson Self-indicating Platform Weighing Machine
16/2/70

FIGURE 6/9C/4 - 2



Suspension Unit and Fulcrum Stand

28/4/72

CP
C

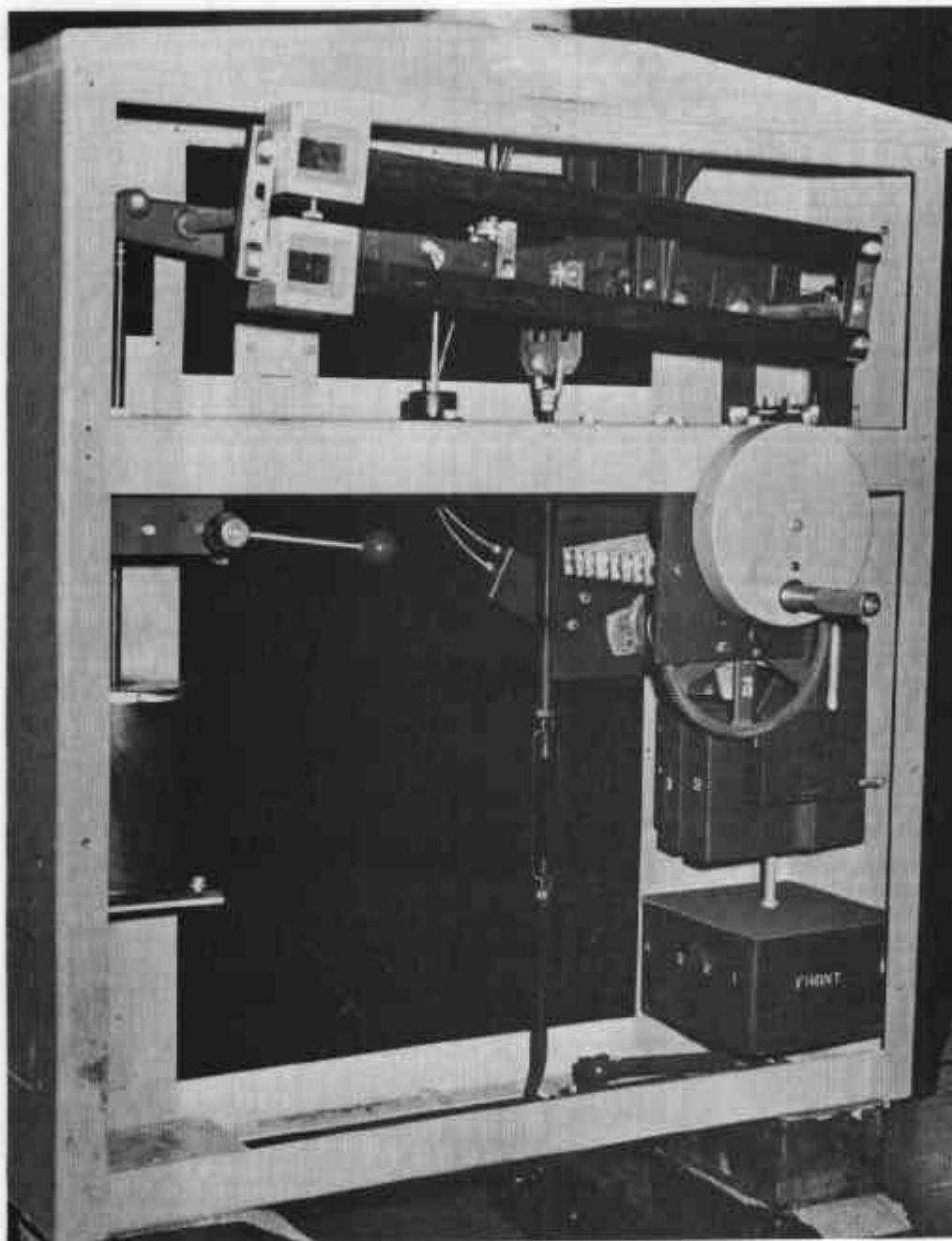
FIGURE 6/9C/4 - 3



Main and Transfer Levers, 15 000 lb Baseworks

16/2/70

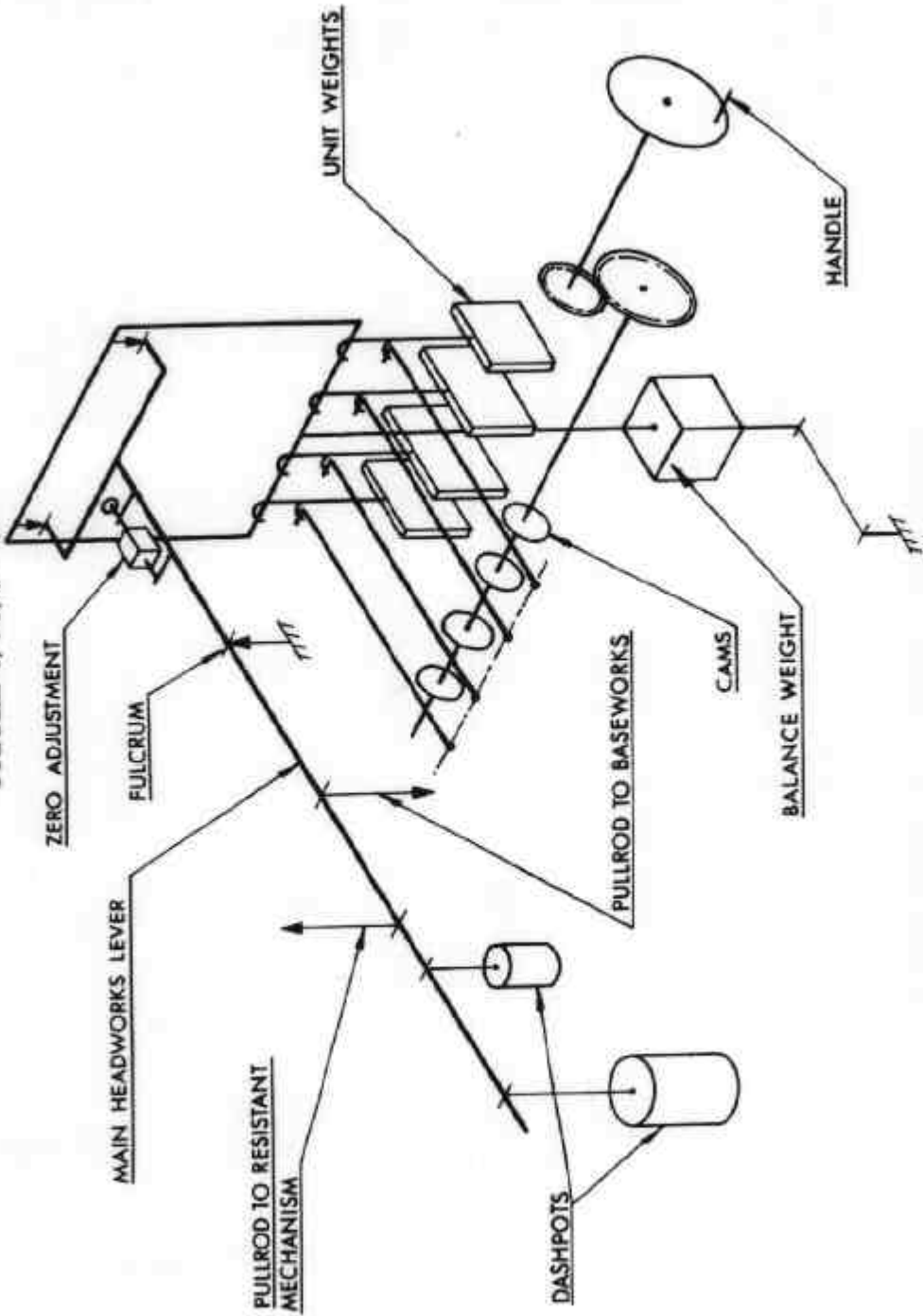
FIGURE 6/9C/4 - 5



Headworks Cabinet Showing Main Lever, Tare Bars,
Locking Lever, Unit Weight Mechanism and Covered
Balance Weight

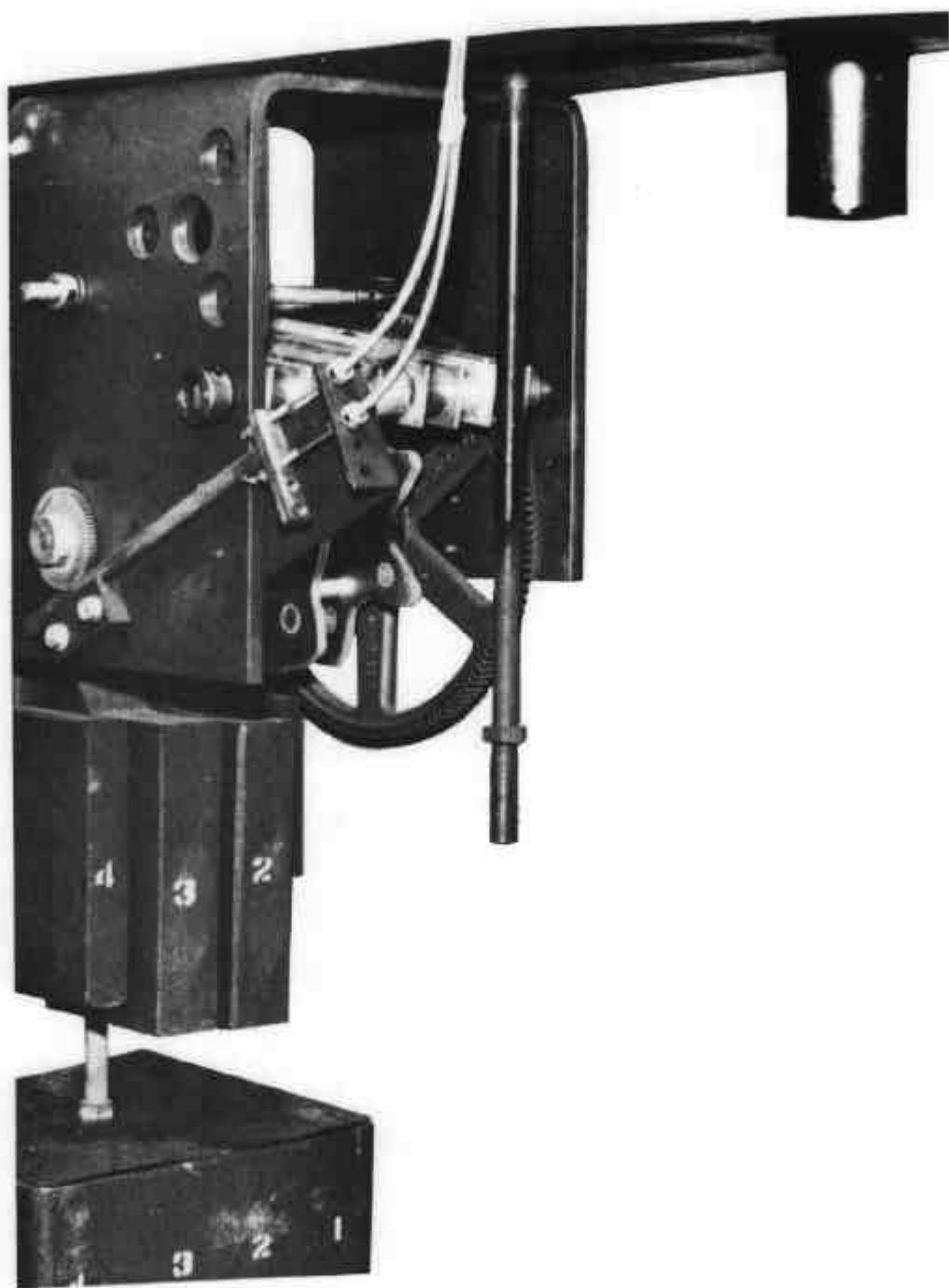
16/2/70

FIGURE 6/9C/4 - 6



Main Headworks Lever and Unit Weight Mechanism -
Tare Bars and Locking Device Not Shown

FIGURE 6/9C/4 - 7



Drive from Unit Weight Mechanism
to Charts in Dial Housing

16/2/70

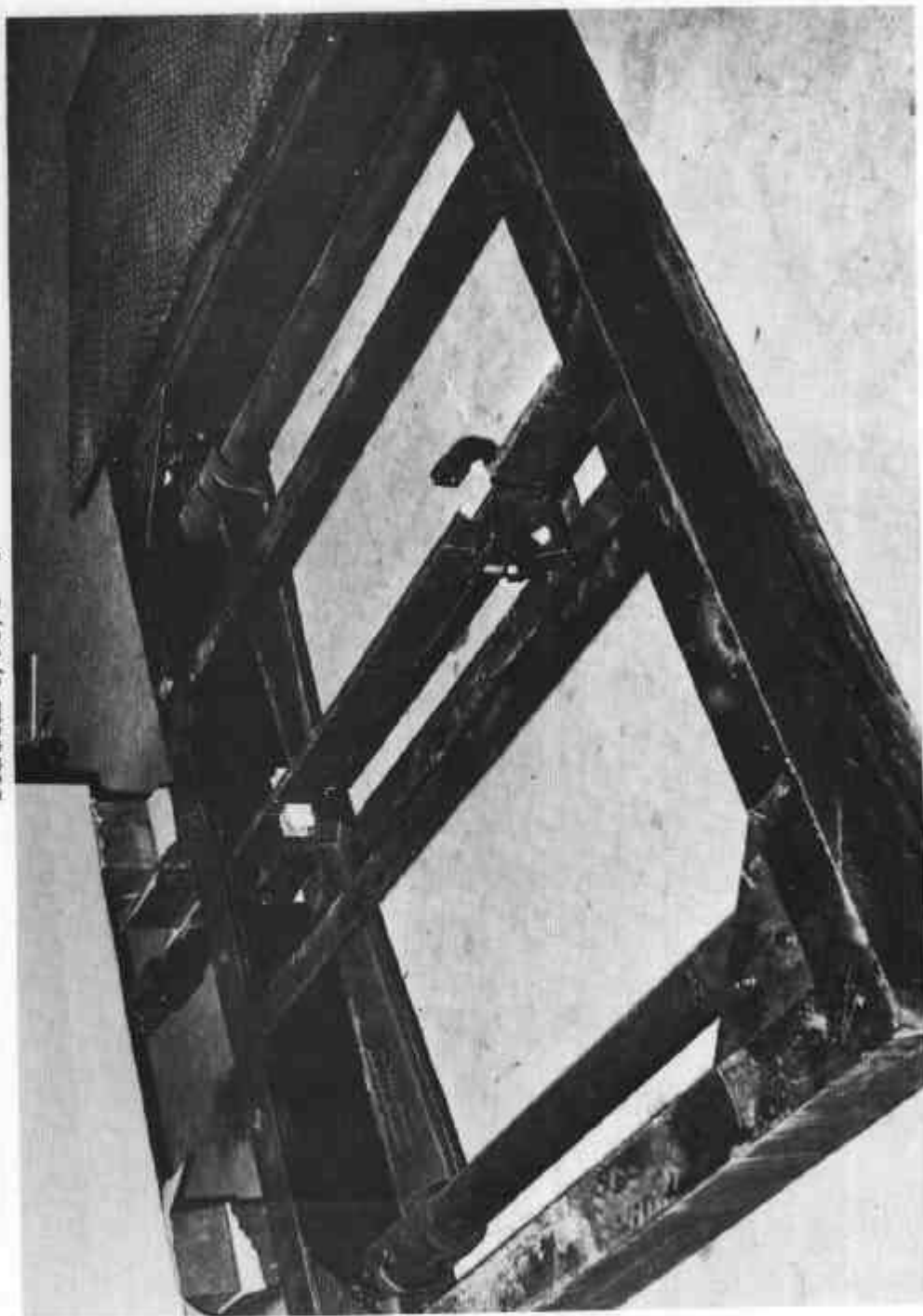
FIGURE 6/9C/4 - 8



Howe Richardson Self-indicating Platform Weighing Machine
16/2/70

C

FIGURE 6/9C/4 - 9

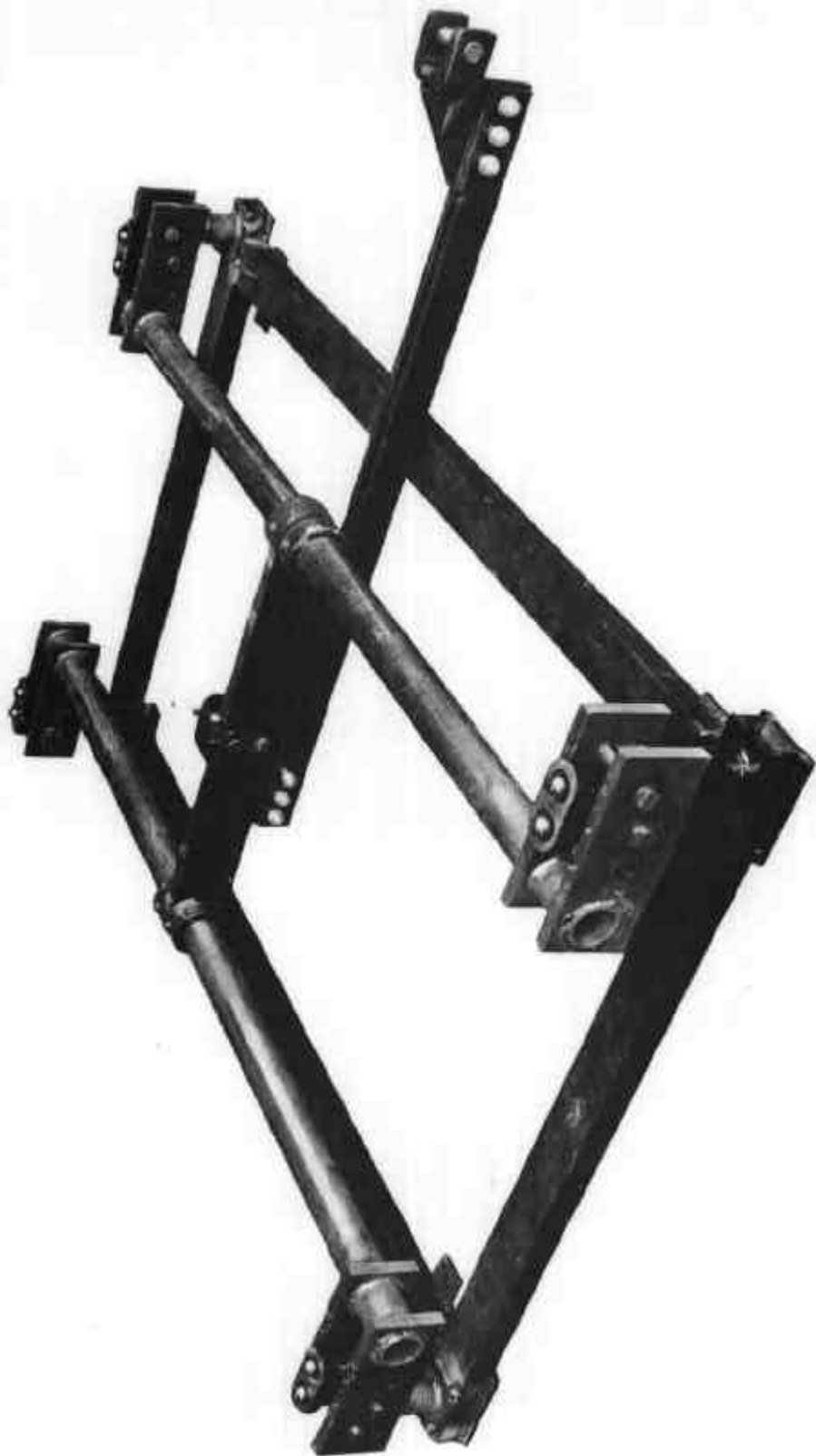


Main and Transfer Levers

C

16/2/70

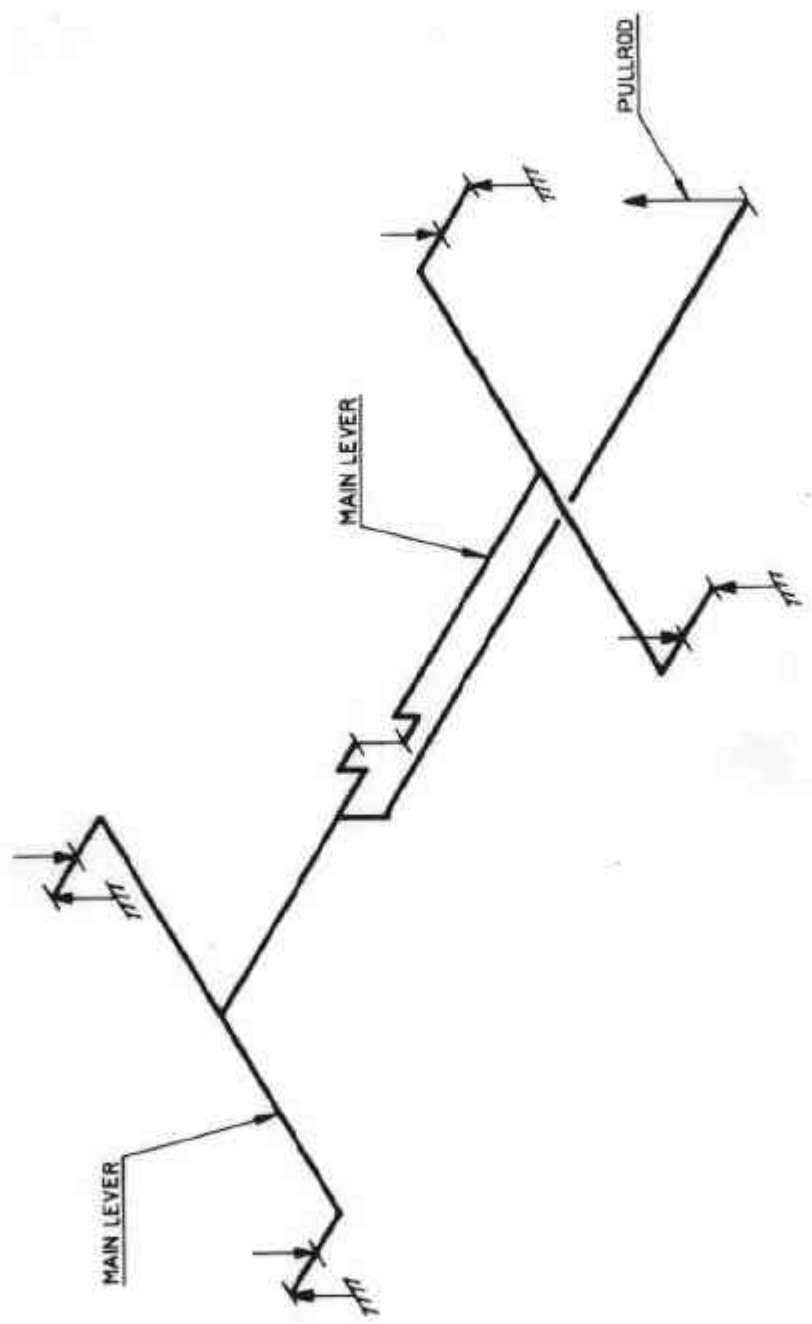
FIGURE 6/9C/4 - 10



Main Levers - 8000 lb Baseworks

16/2/70

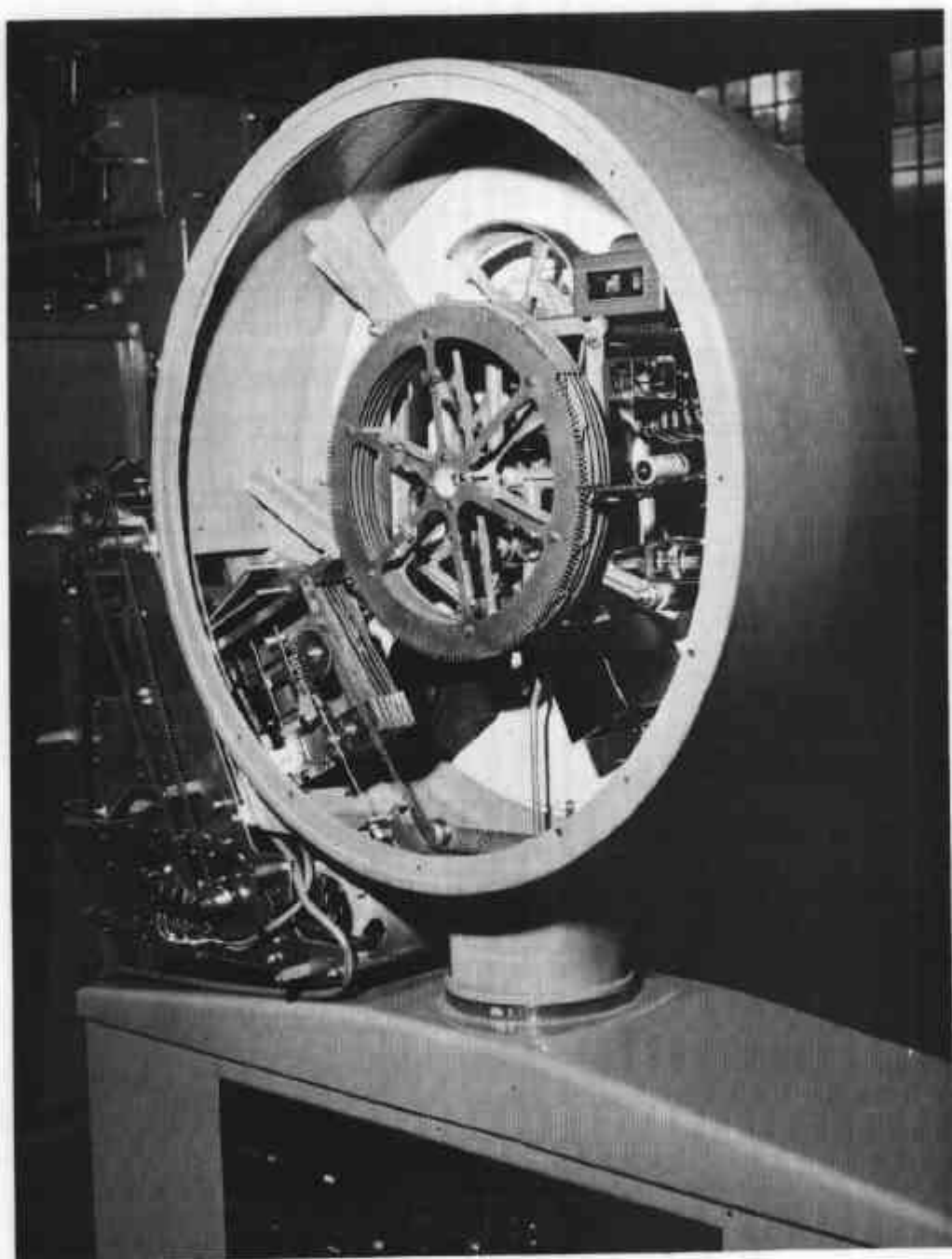
FIGURE 6/9C/4 - 11



Lever Mechanism - 8000 lb Baseworks

16/2/70

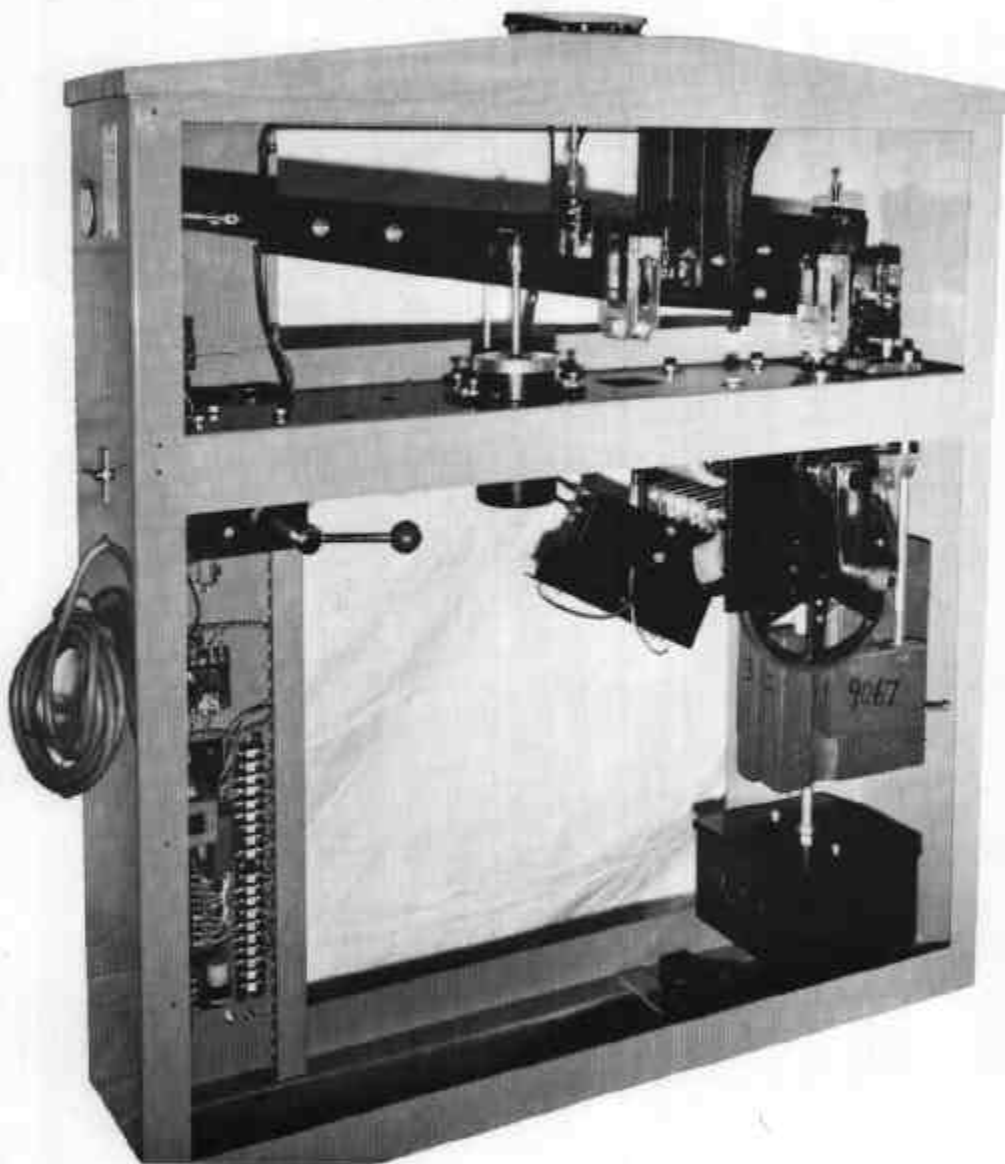
FIGURE 6/9C/4 - 12



M-R Printer and Type 31000 Cabinet

16/2/70

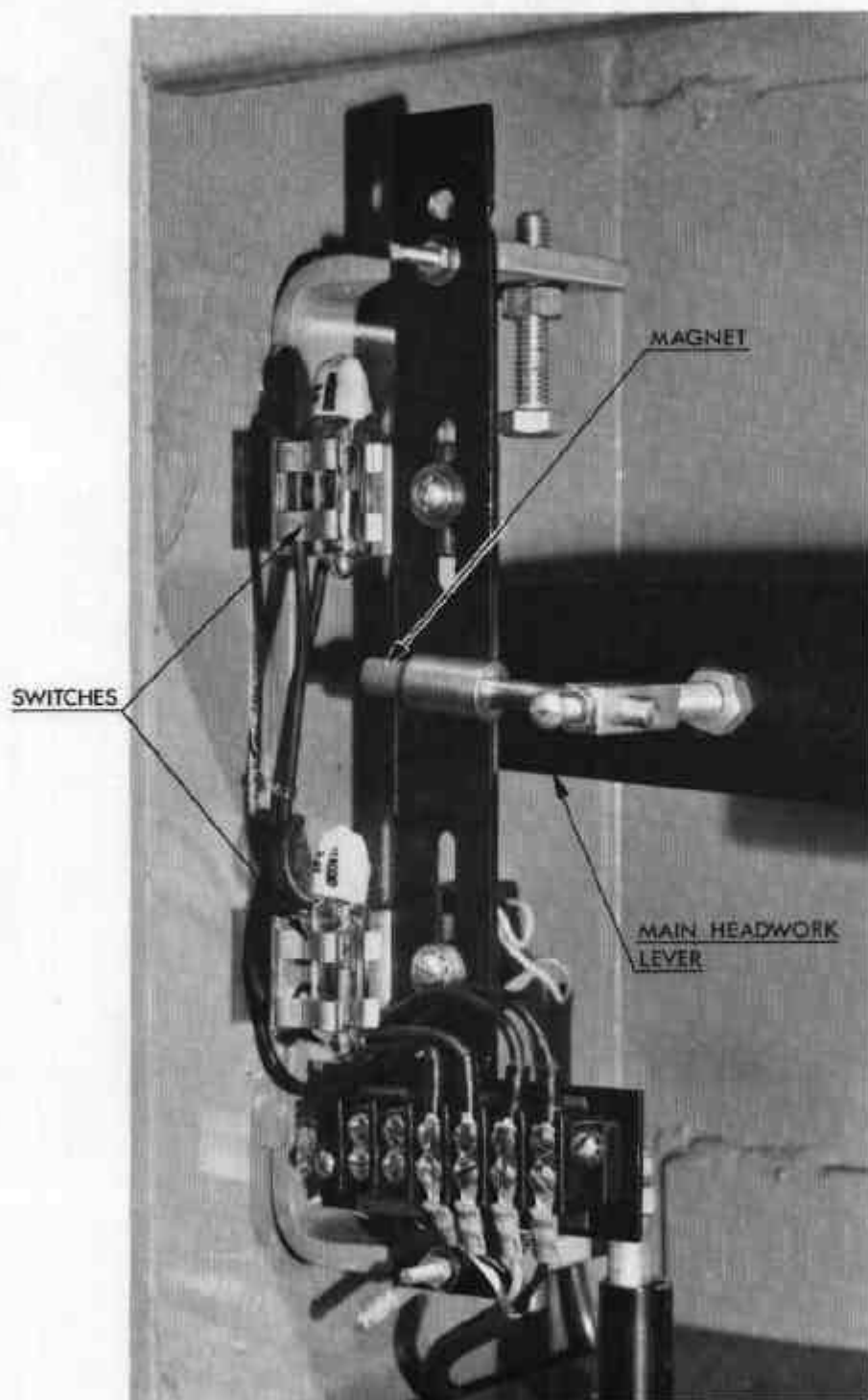
FIGURE 6/9C/4 - 13



Automatic Unit-weight Mechanism — Front View

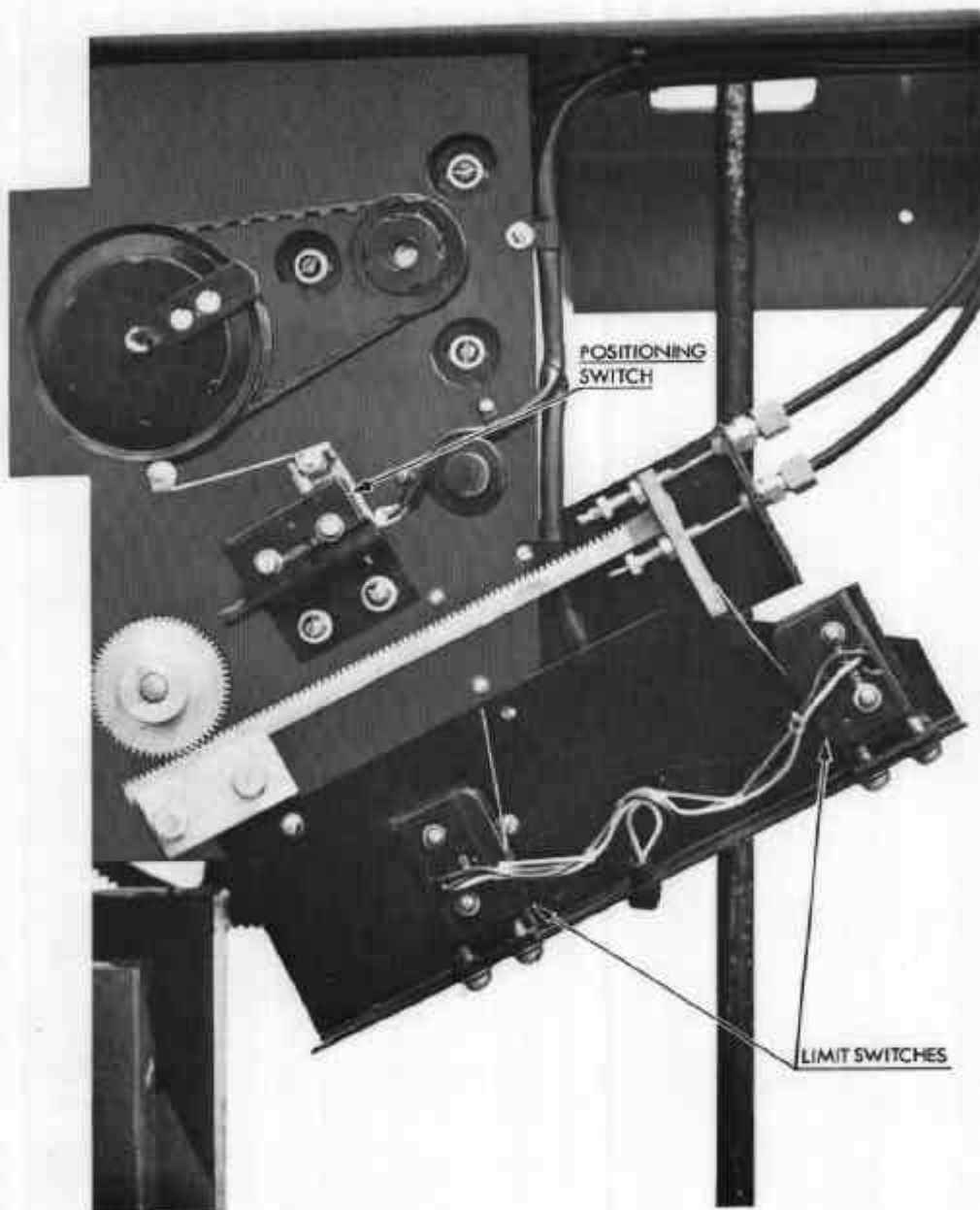
28/4/72

FIGURE 6/9C/4 - 14



Magnetic Switches — Automatic Unit-weight Mechanism
28/4/72

FIGURE 6/9C/4 - 15



Automatic Unit-weight Mechanism — Rear View

28/4/72

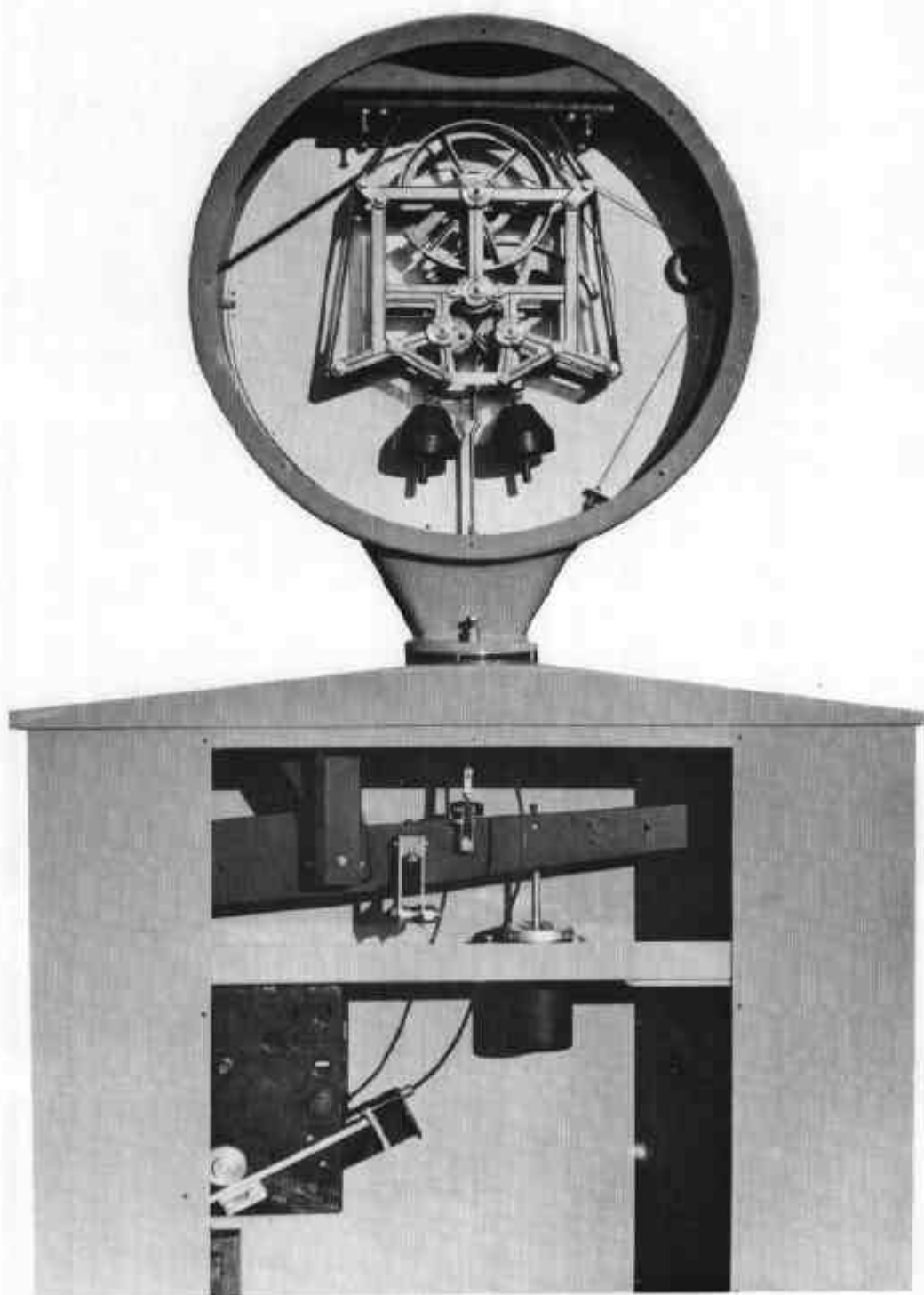
FIGURE 6/9C/4 - 16



Dial with Horizontal Figures

28/4/72

FIGURE 6/9C/4 - 17



Flash-dial Drive
from Manual Unit-weight Mechanism

28/4/72

FIGURE 6/9C/4 - 18



Centre-zero Dial

28/4/72

FIGURE 6/9C/4 - 19

1	2	3	4	5	6	7				10
						VARIANTS				
	COMPONENTS	DATE APPROVED	FOOTNOTES	[PATTERN]	[1]	2	3	4	5	
1	BASEWORK COMPONENTS	19 OCT 66		*		A	A	A	A	A
2	3-lever system to 15 000 lb (Figures 2, 3 & 4)	19 FEB 69		*		A	A	A	A	A
3	2-lever system to 8000 lb (Figures 10 & 11)	19 OCT 66	1	*		†	†	†	†	†
4	3-lever system - 5725 lb (Figure 9)	10 FEB 70								
5	Additional transfer levers									
6	HEADWORK COMPONENTS									
7	Headwork cabinet	19 OCT 66		*		B	B	B	B	*
8	Headwork cabinet with manual unit-weight selector (Figures 5, 6 & 7)	19 OCT 66		*		B	B	B	B	*
9	Headwork cabinet with automatic unit-weight selector (Figures 18, 14 & 15)	17 APR 72		[*]		[C]	[C]	[C]	[C]	
10	Circular dial and flash dial, radially orientated figures (Figure 1)	19 OCT 66				C	C	C	C	
11	Circular dial and flash dial, horizontally orientated figures (Figure 16)	17 APR 72								
12	Circular dial, no flash dial, horizontal figures	19 OCT 66	2			†	†	†	†	D † D †
13	2 dials	19 OCT 66								*
14	Centre-zero dial (Figure 18)	19 FEB 69		*		*	*	*	*	*
15	Double-pendulum tape-drive resistant mechanism	19 OCT 66		*		*	*	*	*	*
16	2 tare bars (1, 2 or none optional in variants)	19 OCT 66		*		†	†	†	†	†
17	M-R printer and motion detector	10 FEB 70				†	†	†	†	†
18	Weight-control unit	19 FEB 69								
19	Full-capacity steelyard	19 FEB 69								
20	Ticket-printing poise	19 FEB 69	3							
	Tare-bar cover (Figure 8)	19 FEB 69								
	HEADWORKS	19 OCT 66		*						*
	Any State-approved or Commission-approved headworks	17 APR 72								*

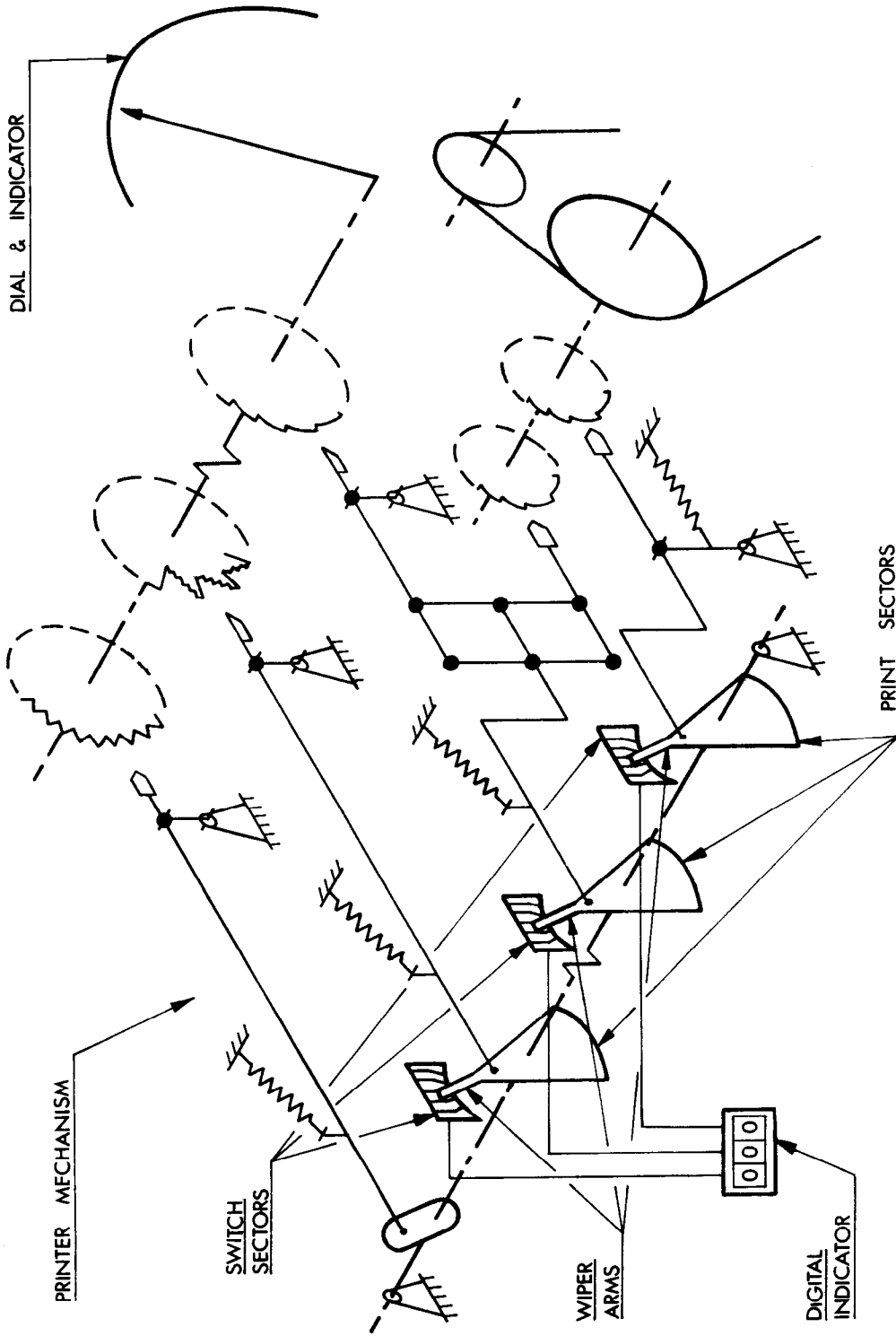
FOOTNOTES

- 1 - Variant 1 is limited to one instrument, Serial No 6602310
- 2 - If the instrument is fitted with 2 dials no tare bars or locking device are fitted
- 3 - Approval expires 30th June 1972

Compatibility Table for Components Described
in this Certificate

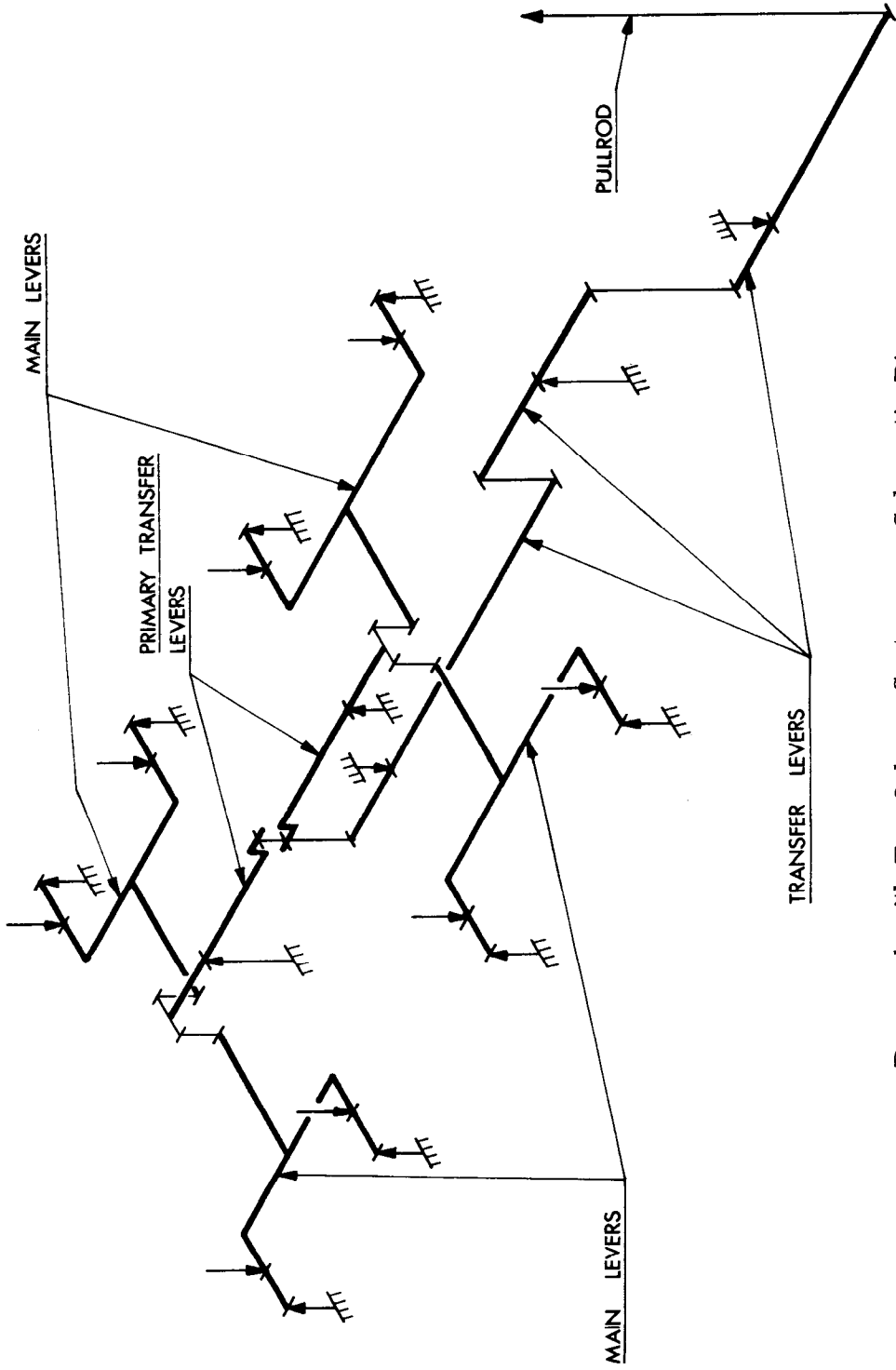
- * - indicates required components
- A, B, C, D - indicates alternative components, one only of which is required
- † - indicates optional components
- [] - approval expired 31st December 1969

FIGURE 6/9C/4 - 20



M-R Ticket Printer with AR3 Digital Transmitter and Display —
Schematic Diagram

FIGURE 6/9C/4 - 21



Basework with Two 3-lever Systems — Schematic Diagram