AUSTRALIA

National Standards Commission

12 Lyonpark Road, North Ryde NSW

Cancellation

Certificate of Approval

No 6/10A/1

Issued under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

Howe Richardson Weighbridge

submitted by Rite-Weigh Scale Service Pty Ltd
9 Wetherill Street
Lidcombe NSW 2141

has been cancelled in respect of new instruments as from 1 May 2002.

Signed by a person authorised under Regulation 60 of the National Measurement Regulations 1999 to exercise the powers and functions of the Commission under this Regulation.

NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 6/10A/1

This is to certify that the pattern and variants of the

Howe Richardson Weighbridge

submitted by Rite-weigh Scale Service Pty Ltd,
9 Wetherill Street,
Lidcombe, New South Wales, 2141,

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

Date of Approval: 20/8/80

Pattern

- Non-self-indicating weighbridge of 30 tonne capacity (approved 21/12/66).

Variants

1. Two baseworks in tandem with maximum capacity 50 t (approved 21/12/66).

2. The pattern and variant 1 with automatic swinging link arrangements (approved 21/12/67).

3. The steelyard in a waterproof enclosure (approved 21/12/67).

4. The steelyard incorporating a ticket-printer poise (approved 7/7/67, withdrawn 30/6/72).

5. The steelyard replaced by a self-indicating headwork (approved 21/12/66).

6. The steelyard replaced by a self-indicating headwork with manual unit weights (approved 2/4/69).

7. The pattern and variants as a fixed weighbridge (approved 2/4/69).

5/9/80

...../2

8. The pattern and variants as a fixed weighbridge mounted over a delivery chute (approved 21/12/66).

9. Self-indicating headwork with photo-electric detector (approved 2/4/69).

10. Self-indicating headwork with mechanical printer (approved 20/4/71).

11. Self-indicating headwork with dial on both sides (approved 20/4/71).

12. Self-indicating headwork with tare bars (approved 20/4/71).

13. Pattern and variants with vehicular rails (approved 20/4/71).

14. The pattern with fixed nose-end knife-edge (approved 21/5/74).

15. Self-indicating weighbridge with automatic unit weights (approved 21/5/74).

16. Additional transfer lever (approved 21/5/74).

17. The pattern and variants 1 and 2 fitted with 100 kg load cell (approved 20/8/80).

18. The pattern and variants 1, 2 and 17 with a Philips PR 1562 indicator approved for up to 3000 scale intervals.

19. The pattern and variants 1, 2 and 17 with a Philips PR 1562 indicator and summing facility approved for up to 3000 scale intervals (approved 20/8/80).

20. The pattern and variants 1, 2 and 17 with a Philips PR 1561 digital indicator, approved for up to 3000 scale intervals.

21. The pattern and variants 1, 2 and 14 with a Dynamic 833G indicator approved for up to 2500 scale intervals.

22. The baseworks of other Commission-approved patterns replacing the abovementioned baseworks (approved 20/8/80).

Variant 22 is subject to review on 31/7/81; the remainder of the approval is subject to review on 31/7/84.

The pattern and variants are described in Technical Schedule No 6/10A/1 and in drawings and specifications lodged with the Commission.

All instruments conforming to this approval shall be marked with the approval number "NSC No 6/10A/1".

This Certificate and Technical Schedule replace pages 1 to 7 of the Certificate issued on 28/4/71, Certificate of Approval No 6/10A/1 - Variation No 1 issued on 21/5/74, and page 1 of Technical Schedule No 6/10A/1 - Variation No 1 issued on 30/5/74, all of which may be destroyed.

Figures 1-22 are retained as part of this Technical Schedule.

Signed

Executive Director

5/9/80

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10A/1

Pattern: Howe Richardson Weighbridge

Submittor: Rite-weigh Scale Service Pty Ltd,
9 Wetherill Street,
Lidcombe, New South Wales, 2141.

1. Description of Pattern

The pattern is a non self-indicating weighbridge of 30 t capacity (Figure 1). It comprises a basework of two second-order main-levers in a fabricated channel-section steel frame fitted with four lifting eyes for transportation (Figure 2). The basework is connected directly to a steelyard resistant headwork.

The frame is fitted at each of its four corners with a fulcrum stand (Figure 3) in which two self-aligning knife-edge bearings support the main levers.

Two second-order main levers and a transfer lever are arranged as shown (Figure 4). Each main lever comprises a steel tube with a centrally located long arm of I-section and two short arms of box-section through each of which are fitted fulcrum and load knife-edge holders; each knife-edge is secured in a groove in the holder by bolts (Figure 3).

The platform is fitted at each corner with a ball-bearing type support unit (Figure 3).

The nose-end of each main lever (Figure 5) terminates in a U-shaped bracket fitted with a knife-edge which engages with a self-aligning bearing carried on the lower end of a vertical link.

The transfer lever fulcrum stand is mounted on two centrally located cross-members of the frame (Figure 5).

The nose-end of the transfer lever (Figure 6) is fitted with a knife-edge carried by a U-shaped bracket, the longitudinal location of which is adjustable; this knife-edge engages with a bearing fitted to a shackle attached to the lower end of the headwork pullrod.

The headwork is a full-capacity steelyard with a major and minor poise (Figure 7).

The top of the steelyard beam is graduated in 1 t increments up to 24 t, and is fitted with a notch-protection bar.

The minor bar, which is extended parallel to the main beam, carries a sliding minor poise and is graduated from zero to 1 t with a maximum of 200 scale intervals.

The balance weight incorporates a zero adjustment.

Seals are provided over the adjusting cavity on the major and minor poises, and over the sensitivity adjuster on the balance weight; the minor bar, the notched bar and steelyard are engraved with the serial number of the instrument.

1.1 Marking

The instrument nameplate is marked with the following data:

Manufacturer's name	
Serial number	
NSC approval number in the form:	NSC No 6/10A/1
Accuracy class in the form:	III
Maximum capacity in the form:	Max ....*
Minimum capacity in the form:	Min ....*
Verification scale interval in the form:	d or d_d=e=...*
Maximum additive tare in the form:	T = + ...

2. Description of Variants

1. Having two or more baseworks coupled together to form a tandem weighbridge up to 50 t total capacity; the lever mechanism of two baseworks is as shown in Figure 21.

2. The frame fitted with four lifting lugs for transportation, through each of which a bumper bolt is fitted to limit horizontal movement of the platform (Figure 8). It is also fitted with four fulcrum stands, each of which comprises two vertical members between which a block is pivoted (Figure 9). A main lever fulcrum knife-edge bearing is supported on the block and is located by a dowell.

* These markings are repeated on the reading face of the instrument.

The short arms of the main levers each comprise two check-plates between which the fulcrum and load knife-edge holders are welded (Figure 10). The nose-end of each main lever is fitted with a knife-edge which engages with a self-aligning bearing carried on the lower end of a vertical shackle assembly at the top of which is another bearing supported by a knife-edge fitted to the transfer lever (Figure 11).

The platform is supported at each corner by a parallel-link suspension unit comprising a yoke between the arms of which a grooved pin is fitted (Figures 12 and 13).

The transfer lever has a fulcrum end of box form (Figure 11), in which are fitted the fulcrum and load knife-edges. The transfer lever is unbolted and removed from its box-end when the weighbridge is being transported.

3. Being fitted with a weatherproof enclosure which surmounts the headwork cabinet (Figure 14). The front cover is hinged to provide access to the steelyard. The limiting dimensions are illustrated in Figure 15.

4. Being fitted with a full-capacity steelyard which incorporates a ticket-printing poise (Figure 16).

5. With the steelyard headwork and cabinet replaced by a self-indicating headwork with manual unit weights described in Certificate No 6/9C/4.

6. With the steelyard headwork and cabinet replaced by the self-indicating headwork with manual unit weights described in Certificate No 6/10B/1.

7. Installed as a fixed weighbridge, in which case the basework has no steel frame, the main and transfer lever fulcrum stands are independently mounted, and the transfer lever is in one piece.

8. Installed as a fixed basework mounted over a delivery chute to form a grain-dump weighbridge. The platform consists of an open grid fitted to a framework of steel beams. Deflector plates (Figure 17) are fitted to the beams to prevent accumulation of grain on any part of the basework. The long arm of each main lever is attached to

that end of the tubular section closest to the headwork (Figure 18) and the transfer lever is in one piece. The lever arrangement is as shown in Figure 19. A counterweighted intermediate lever is incorporated in the headwork cabinet (Figure 20).

9. With the self-indicating headwork fitted with a photo-electric switch as described in Certificate No 6/10B/1.

10. With the self-indicating headwork fitted with the ticket-printing mechanism described in Certificate No 6/10B/1.

11. With the self-indicating headwork fitted with a dial on the front and the rear of the dial housing, provided that no locking devices or tare bars are fitted.

12. With the self-indicating headwork fitted with tare bars.

13. With a platform fitted with vehicular rails.

14. With the nose-end knife-edge fixed in a machined groove in a bracket by a bolt which screws into the back of the knife-edge (Figure 22). The bracket is located on the lever by a top and bottom stop and clamped by a bolt.

15. With the self-indicating headwork fitted with automatic unit weights as described in Certificate No 6/9C/4.

16. With the headwork located in any reasonable position in relation to the basework, in which case one or more transfer levers may be used, provided that they are fully protected.

17. The pattern and variants 1 and 2 fitted with a load-cell resistant mechanism comprising an intermediate lever and a Philips 6228 100 kg cantilever type load cell (Figure 23). The lever ratio is selected so that at maximum capacity the force applied to the load cell is between 390 N and 980 N.

18. The pattern and variants 1, 2 and 17 fitted with a Philips PR 1562 mass indicator which displays up to 3000 increments (Figure 24). The mass-indicator unit is a combined mass indicator and basework-selector unit, allowing the output of the load cells of up to three load receptors to be individually displayed on the mass indicator. Each load receptor has the same maximum capacity, and is selected by one of three push-buttons on the front of the mass-indicator unit.

A separate calibration circuit and zero adjustment is provided for each load receptor selected. Three zero devices are provided.

The mass-indicator unit converts the mass information from the selected load cells into a digital indication of mass by counting, over a preset period, the number of pulses from an oscillator whose frequency of oscillation is proportional to the load on the load cells. The counting is repeated continuously and, while the counts in successive periods differ, that is, the instrument is not in equilibrium, the indicator illumination is at half brightness. Upon the instrument reaching a steady state, detected as equal counts in successive periods, the indicator is illuminated at full brightness.

Zero balance is set for the selected load receptor by the appropriate zero-adjustment knob on the front of the mass-indicator unit; a light adjacent to the word ZERO illuminates when zero is set within ±0,25 e.

A push-button TARE allows automatic taring of the load on the load receptor selected to within ±0,25 e. On removal of the load the value of the tare to the nearest whole graduation is indicated on the mass indicator prefixed by a minus sign. The tare is subtractive and of maximum effect equal to the capacity of the instrument. When a tare is selected the push-button marked TARE will illuminate.

A negative gross mass is indicated by a flashing numerical indication suffixed by a flashing minus sign.

An output socket on the mass-indicator unit may provide data to peripheral devices which are not a part of the measuring instrument. These devices, which may only be provided with the authorisation of the verifying authority of the State or Territory, may, for example, store and process the data, etc.

The load-cell connectors and the output sockets are located beneath a sealed cover on the rear of the mass-indicator unit (Figure 25). The cover of the mass-indicator unit is only removable after the sealed rear cover is removed. Each basework number and the serial numbers of the load cells of each basework are identified by a tag or tags which are sealed to the instrument by the seal securing the rear cover (Figure 25).

Marking

The instrument's nameplate is marked with the following data:

Manufacturer's name:	
Serial number:	
NSC approval number in the form:	NSC No 6/10A/1
Accuracy class in the form:	III
Platform:	A B C
Maximum capacity in the form:	Max ...,Max ...,Max..*
Minimum capacity in the form:	Min ...,Min ...,Min..*
Verification interval in the form:	d_d=e...,d_d=e...,d_d=e *
Maximum subtractive tare in the form:	T=-....,T=-....,T=-....

19. The pattern and variants 1, 2 and 17 fitted with a Philips PR 1562 mass indicator.

The Philips PR 1562 mass-indicator unit has a combined mass indicator and basework-selector and combination unit, allowing the output of the load cell of two load receptors to be individually displayed on the mass indicator and the output of the load cell of the two load receptors to be displayed in combination. Each load receptor has the same maximum capacity and the combination of two load receptors has the maximum capacity of either load receptor. Each load receptor or the combination is selected by three push-buttons on the front of the mass-indicator unit.

Marking

Manufacturer's name:	
Serial number:	
NSC approval number in the form:	NSC No 6/10A/1
Accuracy class in the form:	III
Platform:	A B A + B
Maximum capacity in the form:	Max ...,Max ..,Max..*
Minimum capacity in the form:	Min ...,Min ..,Min..*
Verification interval in the form:	d_d=e...,d_d=e..,d_d=e..*
Maximum subtractive tare in the form:	T=-....,T=-...,T=-..*

20. The pattern and variants 1, 2 and 17 fitted with a Philips PR 1562 mass-indicator unit which is similar to

*These markings are repeated on the reading face of the instrument.

the PR 1562 mass indicator unit but without the basework selector, thus allowing its use with only one basework (Figure 26).

Marking

Maximum capacity in the form:	Max ....*
Minimum capacity in the form:	Min ....*
Verification interval in the form:	d_d=e....*
Maximum subtractive tare in the form:	T=-.....

(Other markings as for pattern)

Sealing is by the same method as for the PR 1562 (Figure 25).

21. The pattern and variants 1, 2 and 14 fitted with a Rite-weigh Dynamic 833G mass indicator which converts the output from the load cell into a digital weight indication of up to 2500 increments (Figure 27). The instrument is provided with a zero tracking facility which will automatically rezero the instrument whenever it comes to rest within ±0,5 scale interval of zero; this is indicated by the illumination of a zero light. A press button marked ZERO is provided for rezeroing the instrument when zero has changed by more than ±0,5 scale interval. A spring-loaded three-position test switch marked VERIFY can be used to blank out the indicator or display ALL-8 while the switch is held pressed. This checks that the display is working correctly.

Two lead-and wire seals prevent the covers being removed from the mass indicator (Figure 28). The cable from the load cell is internally connected within the mass indicator.

Marking

Maximum capacity in the form:	Max ....*
Minimum capacity in the form:	Min ....*
Verification interval in the form:	d_d=e....*
Maximum subtractive tare in the form:	T=-.....

(Other markings as for pattern)

* These markings are repeated on the reading face of the instrument.

An output cable may be internally connected inside the mass indicator to provide mass information to peripheral devices which are not a part of the measuring instrument.

22. The baseworks of other Commission-approved patterns replacing the baseworks of the pattern and variants, 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; and

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

(c) additional transfer levers may be used; and

(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; and

(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; and

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

Headwork NSC No 6/10A/1
Basework NSC No ....

3. 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 indication at zero being adjusted in the reference position before tilting and in the tilted position before reloading.

(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. Sensitivity test for non-self-indicating instruments

A mass equal to the absolute value of the maximum permissible error at the load considered, placed on the instrument, loaded or unloaded, should cause a permanent displacement of the index of at least 5 mm.

3. Accuracy requriements

The maximum permissible error is:

$\pm$0,5e for loads between zero and 500e inclusive; and

$\pm$1e for loads above 500e and up to 2000e; and

$\pm$1,5e for loads above 2000e.

4. Tests for the digital indicator

(a) Zero balance – place a small weight equal to, say, 10 scale intervals (10 d_d) on the load receptor before checking zero. Two readings are taken at each applied load with the instrument equilibrium being disturbed before each reading.

With an additional load of 0,25 d_d, that is, 10,25 d_d, on the load receptor, readings of 11 d_d and 11 d_d indicate that the alignment of the instrument is not correct, readings of 10 d_d and 11 d_d or 10 d_d and 10 d_d are acceptable.

With an additional load of 0,50 d_d, that is, 10,75 d_d, on the load receptor, readings of 10 d_d and 10 d_d indicate that the alignment of the instrument is not correct, readings of 10 d_d and 11 d_d or 11 d_d and 11 d_d are acceptable.

(b) Zero range – the maximum range of operation of the zero device should not exceed 4% of the capacity of the instrument ($\pm$2% approximately).

(c) Load cell creep – leaving a maximum-capacity load on the load receptor for a period of 30 minutes should not cause the weight indicated to be incorrect, and on removal of the load the mass indicated should be zero.

(d) Test loads – the application of the test loads specified in Table 1 and the display of these loads within the applicable tolerance can be used to check that the instrument operates in accordance with the approved design.

(e) Range of indication – the maximum mass indicated should not exceed the maximum capacity (max); above this indicated mass the indicator should be blank.

TABLE 1

Test Load in % of Full Load Capacity *

1.5%		16.0%	+ 0.5 Scale Interval
2.4%		25.0%	+ 0.5 Scale Interval
4.0%		40.0%	+ 0.5 Scale Interval
6.3%		63.0%	
10.0%	+ 0.5 Scale Interval	100.0%	

* Test Load = % x Max Capacity
(rounded to the nearest 0.5 Scale Interval)

Note: The Test Load should include a test at capacity, less the tolerance and less 0.5 Scale Interval.

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/10A/1

CHANGE No 1

The description of the

Howe Richardson Weighbridge

given in Technical Schedule No 6/10A/1 issued on 5/9/80 is altered by adding the attached Table 1.

Signed

Raymond A J Clu

Acting Executive Director

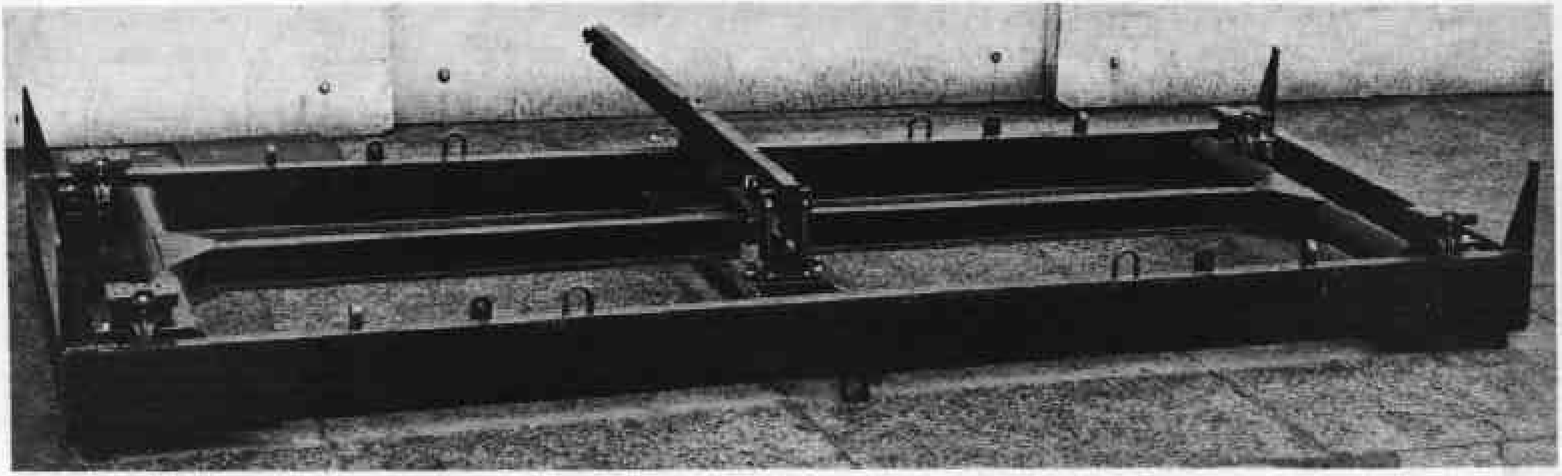
27/10/80

FIGURE 6/10A/1 - 1

28/4/71

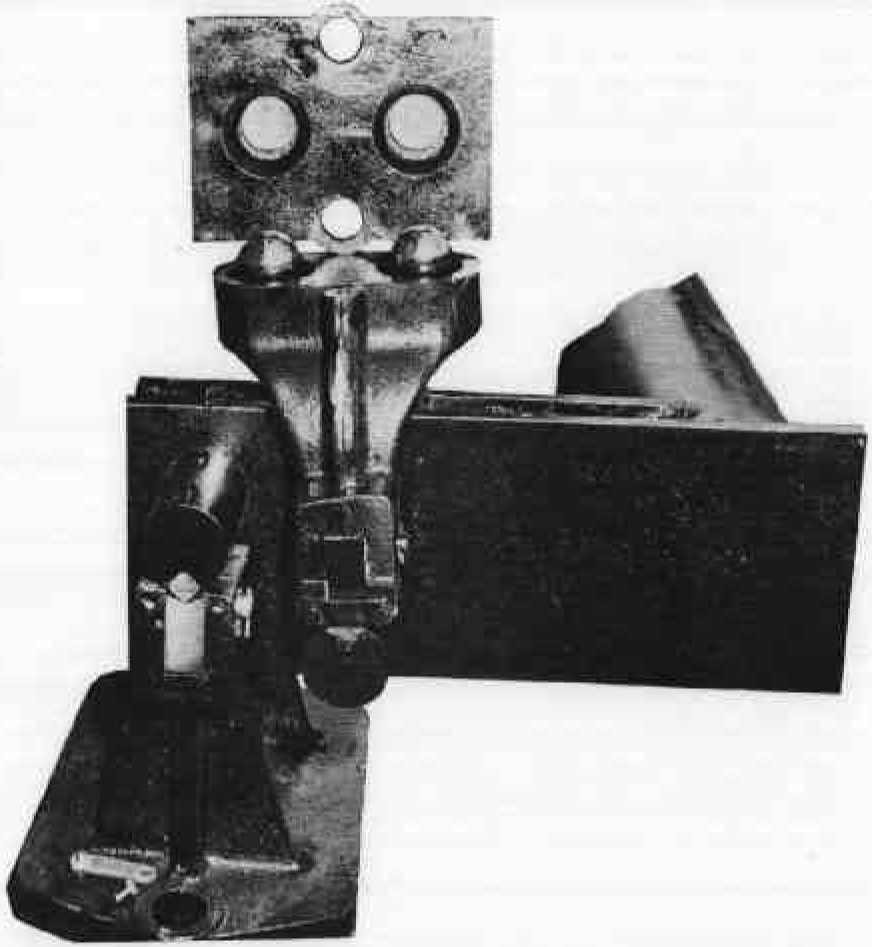
Howe Richardson Portable Weighbridge

FIGURE 6/10A/1 - 2



Portable Weighbridge with Platform Removed

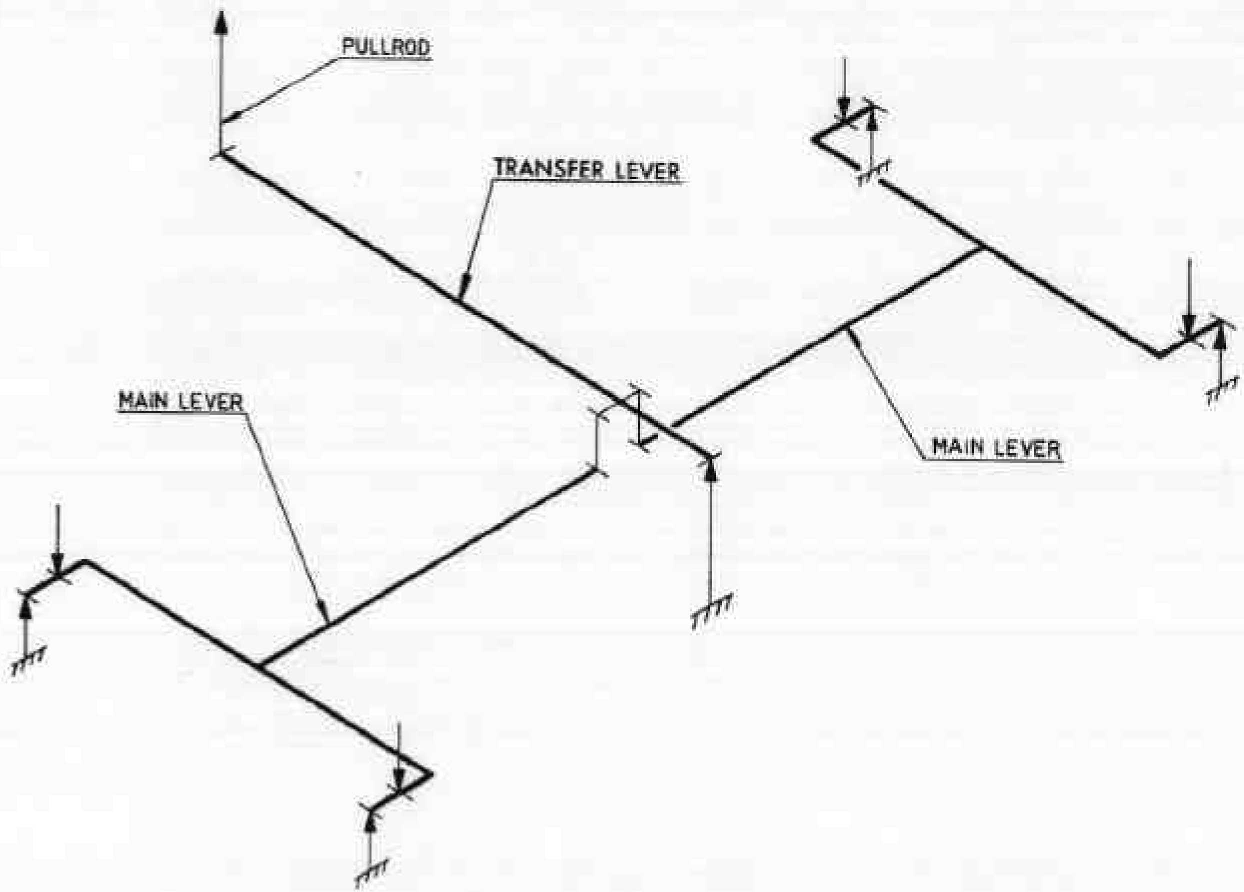
FIGURE 6/10A/1 - 3



Main Load Point — Fulcrum Stand and Ball-bearing Suspension Unit

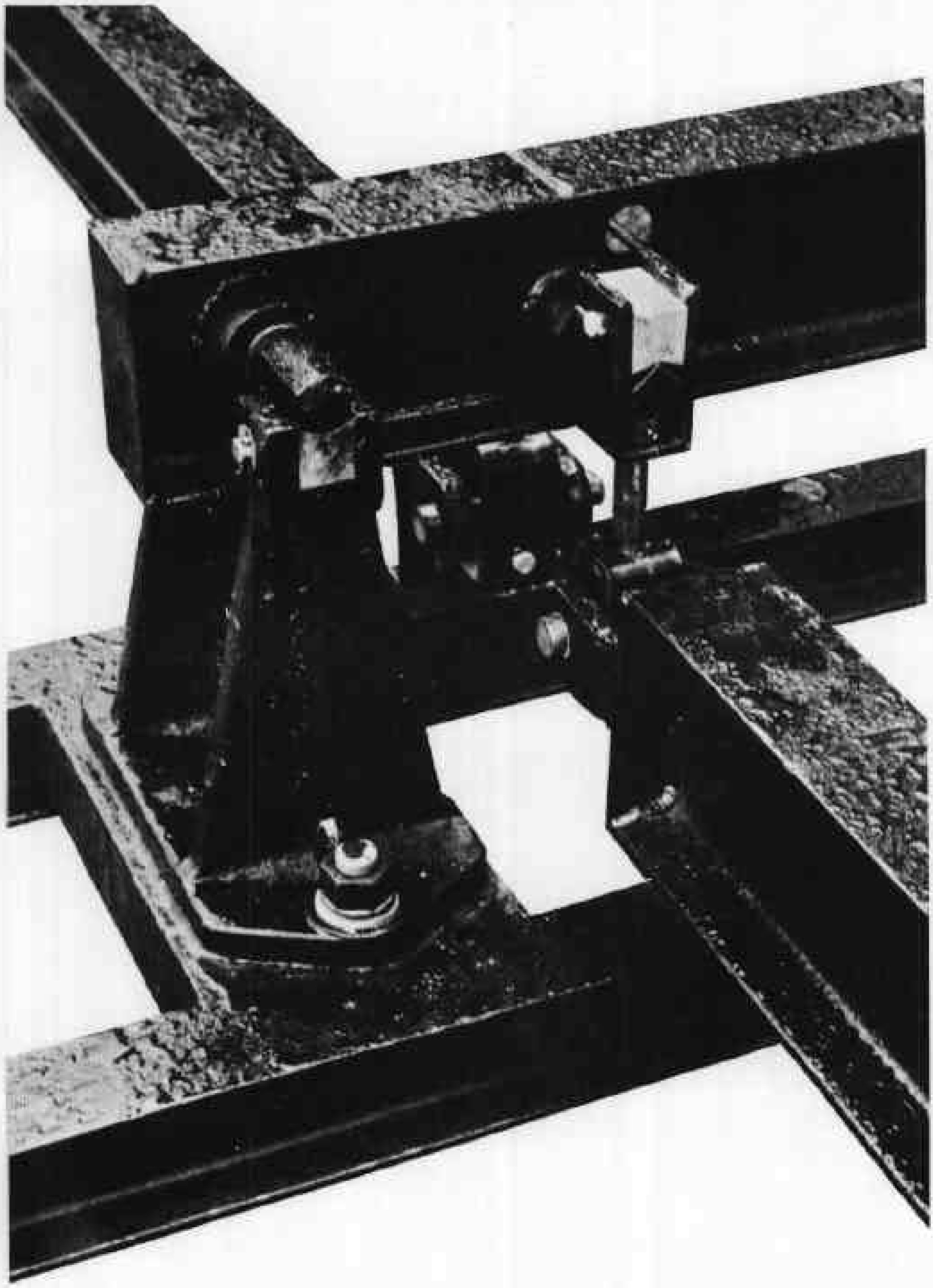
28/4/71

FIGURE 6/10A/1 - 4



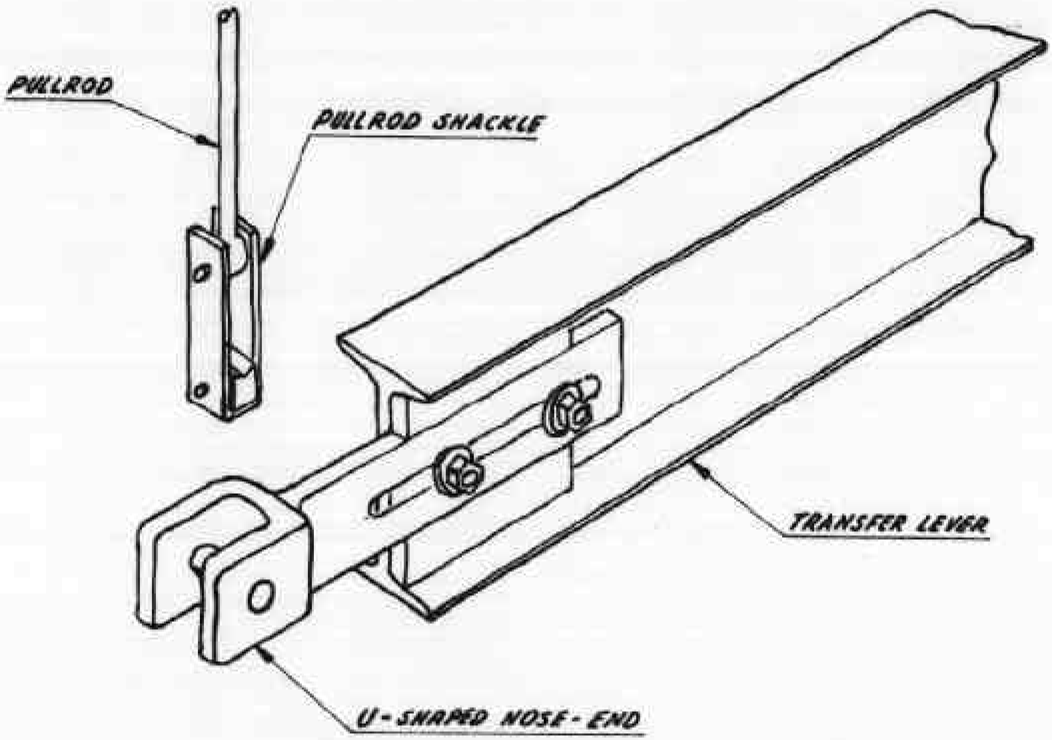
Lever Mechanism

FIGURE 6/10A/1 - 5



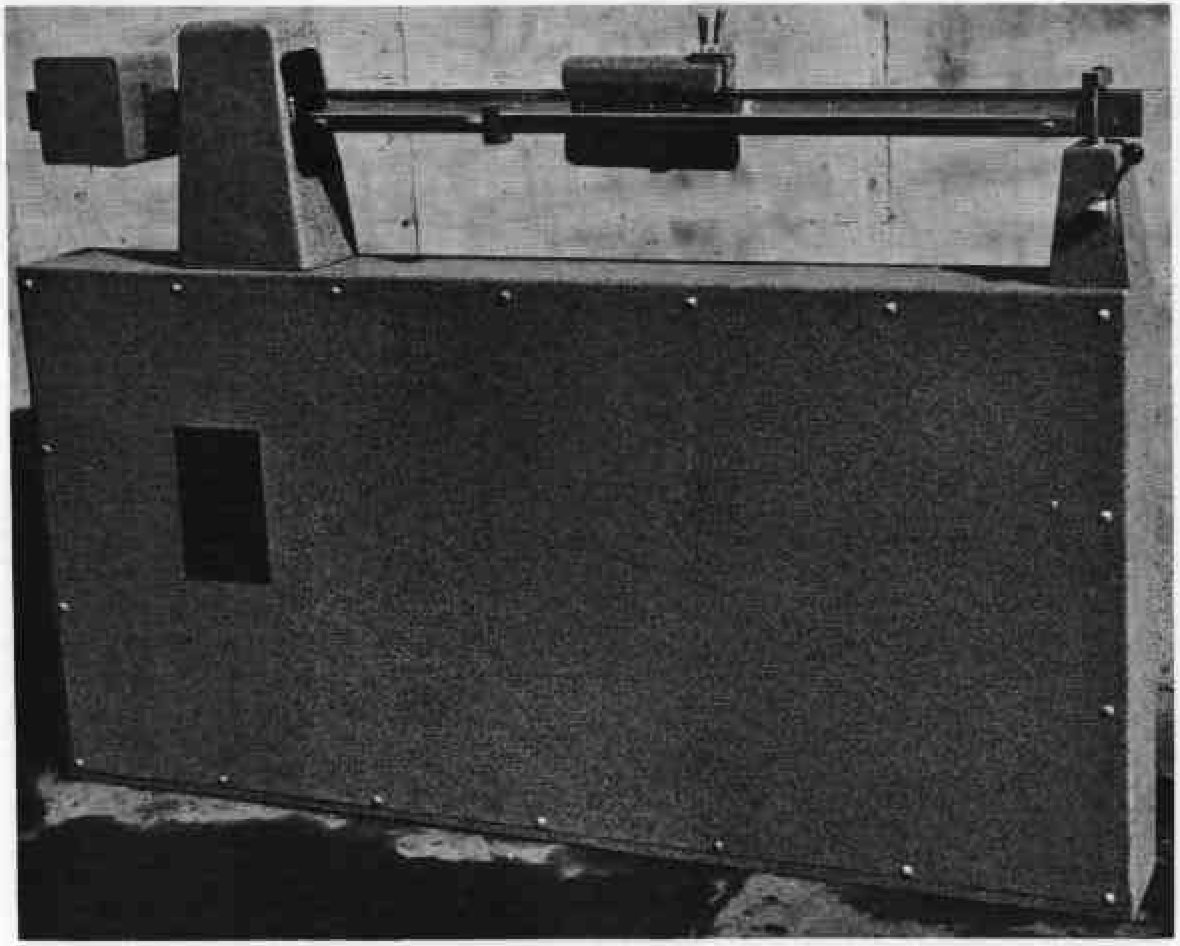
Load Transfer Arrangement

FIGURE 6/10A/1 - 6



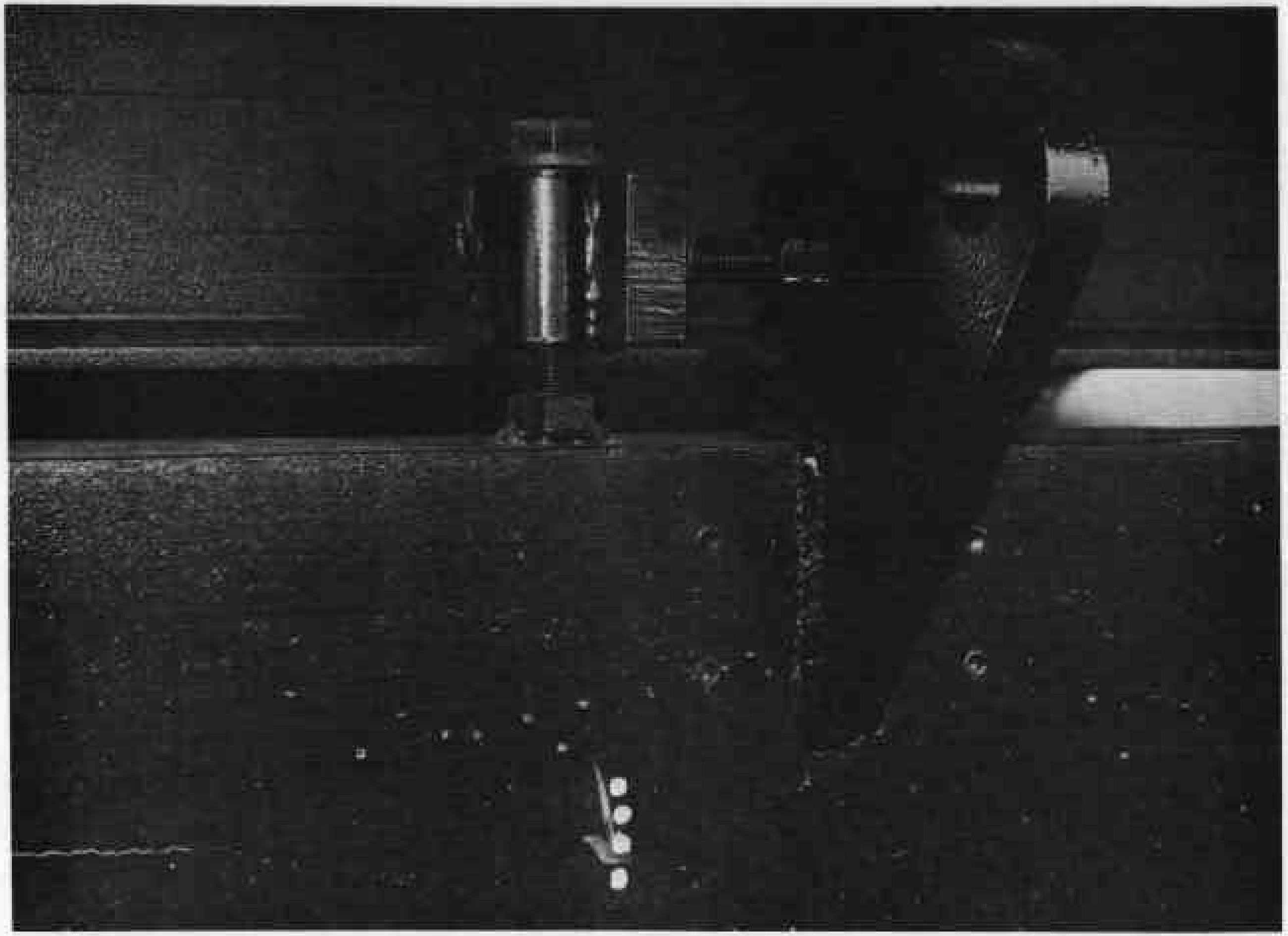
Transfer Lever Nose-end and Pullrod Shackle

FIGURE 6/10A/1 - 7



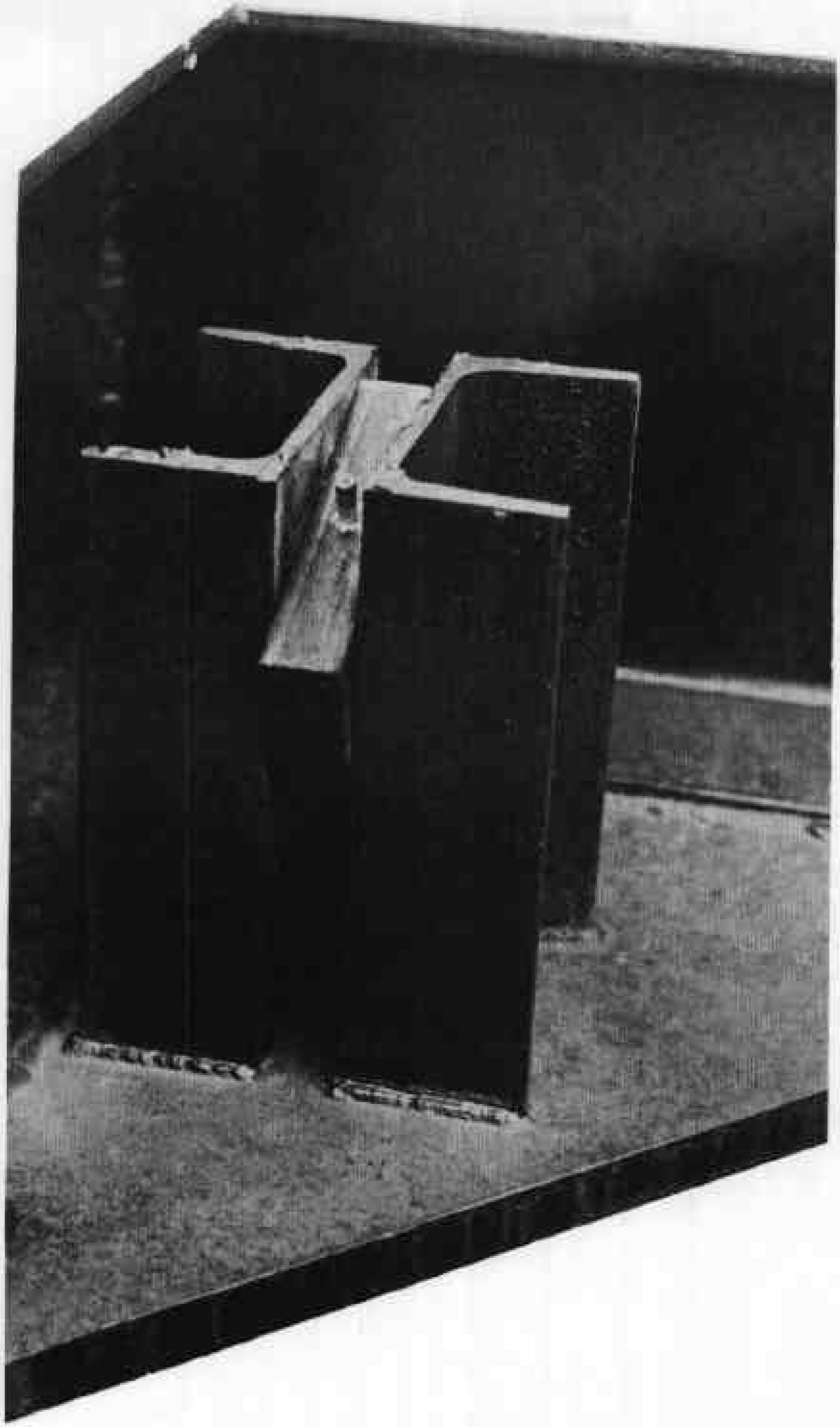
Headwork Cabinet

FIGURE 6/10A/1 - 8



Lifting Lug with Bumper Bolt and Steady Bolt

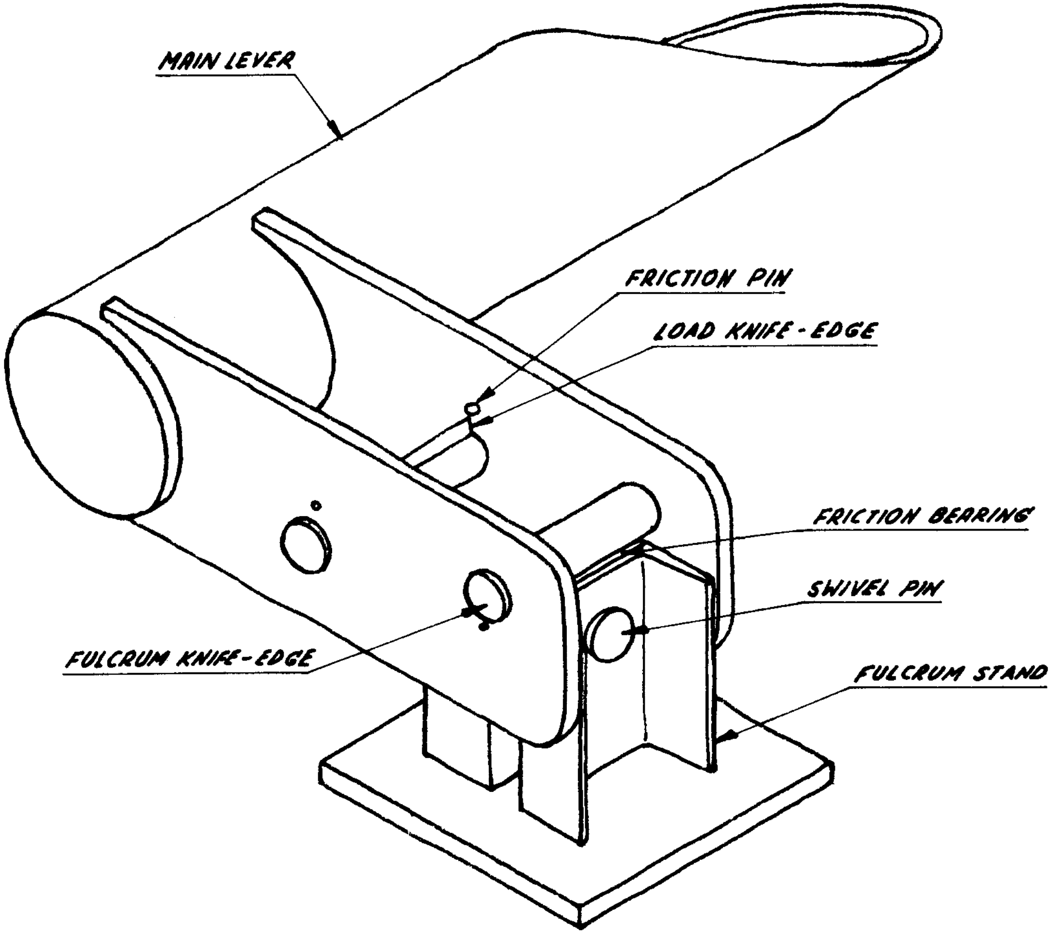
FIGURE 6/10A/1 - 9



Main Lever Fulcrum Stand
(Knife-edge Bearing Not Shown)

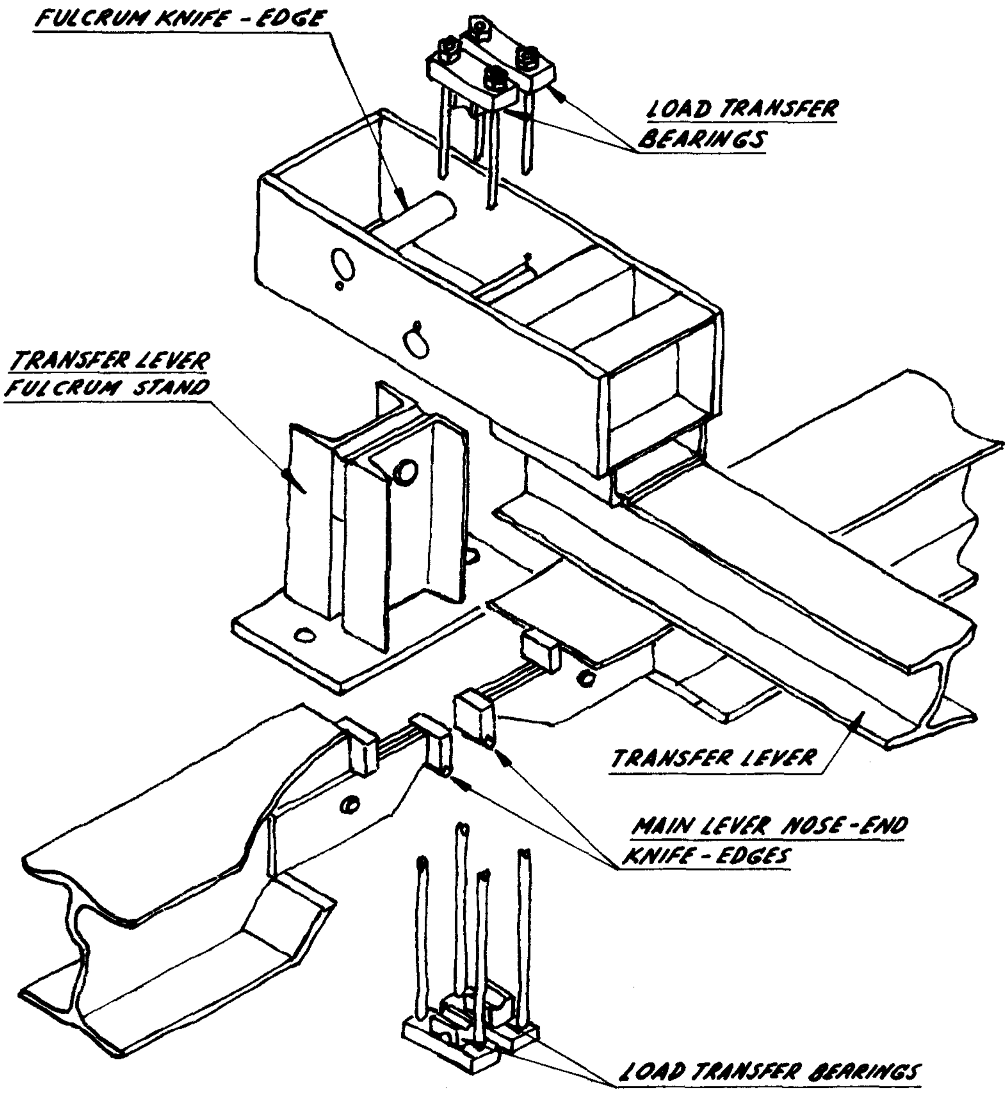
28/4/71

FIGURE 6/10A/1 - 10



Main Load Point (Parallel-link Suspension Unit)

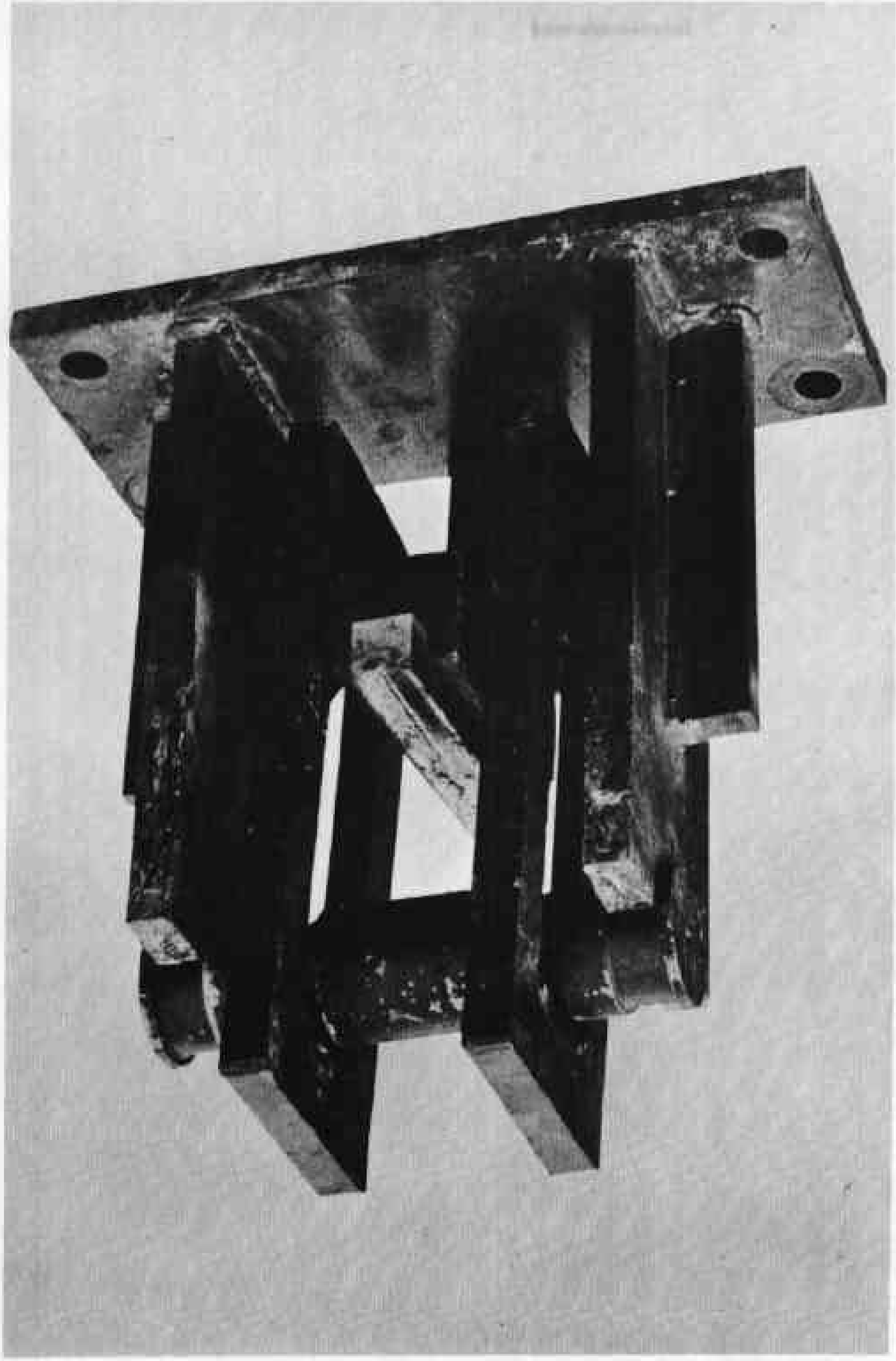
FIGURE 6/10A/1 - 11



Load Transfer Arrangement

28/4/71

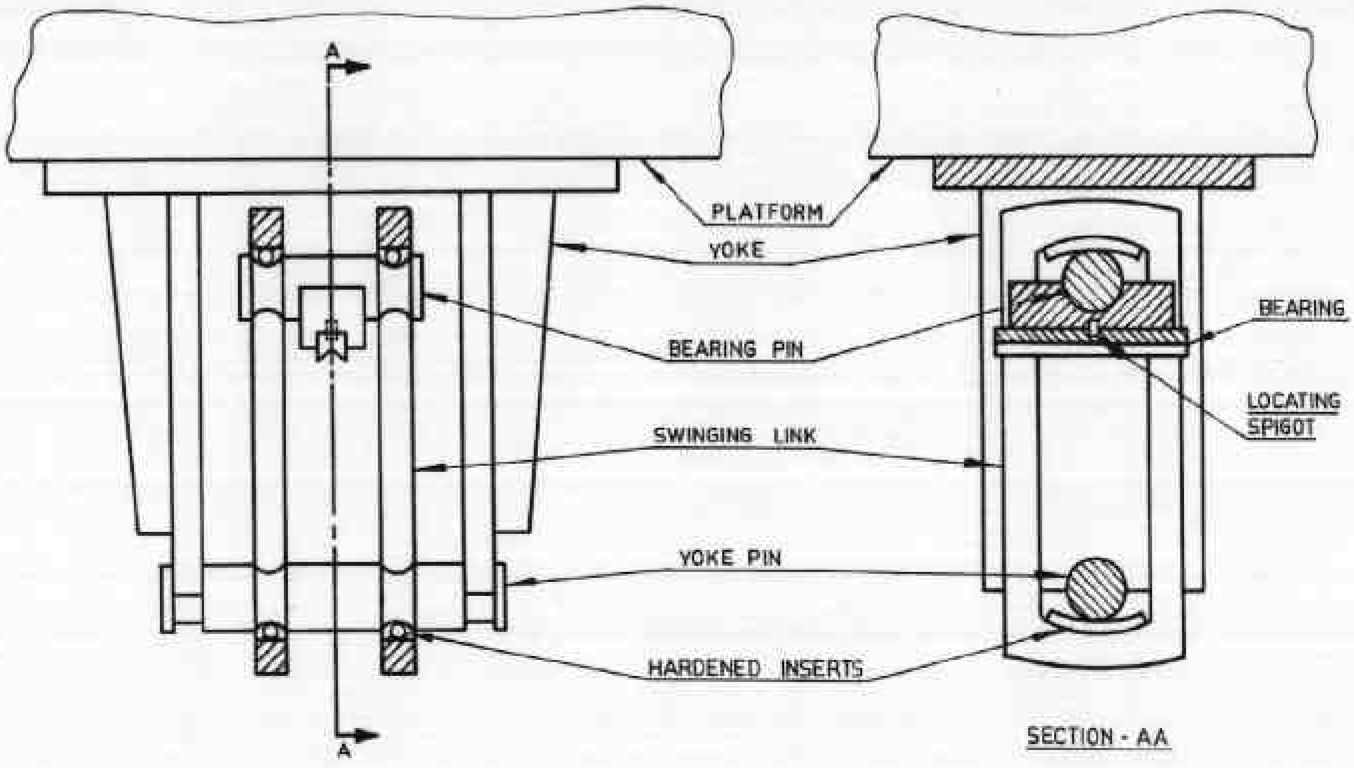
FIGURE 6/10A/1 - 12



Parallel-link Suspension Unit

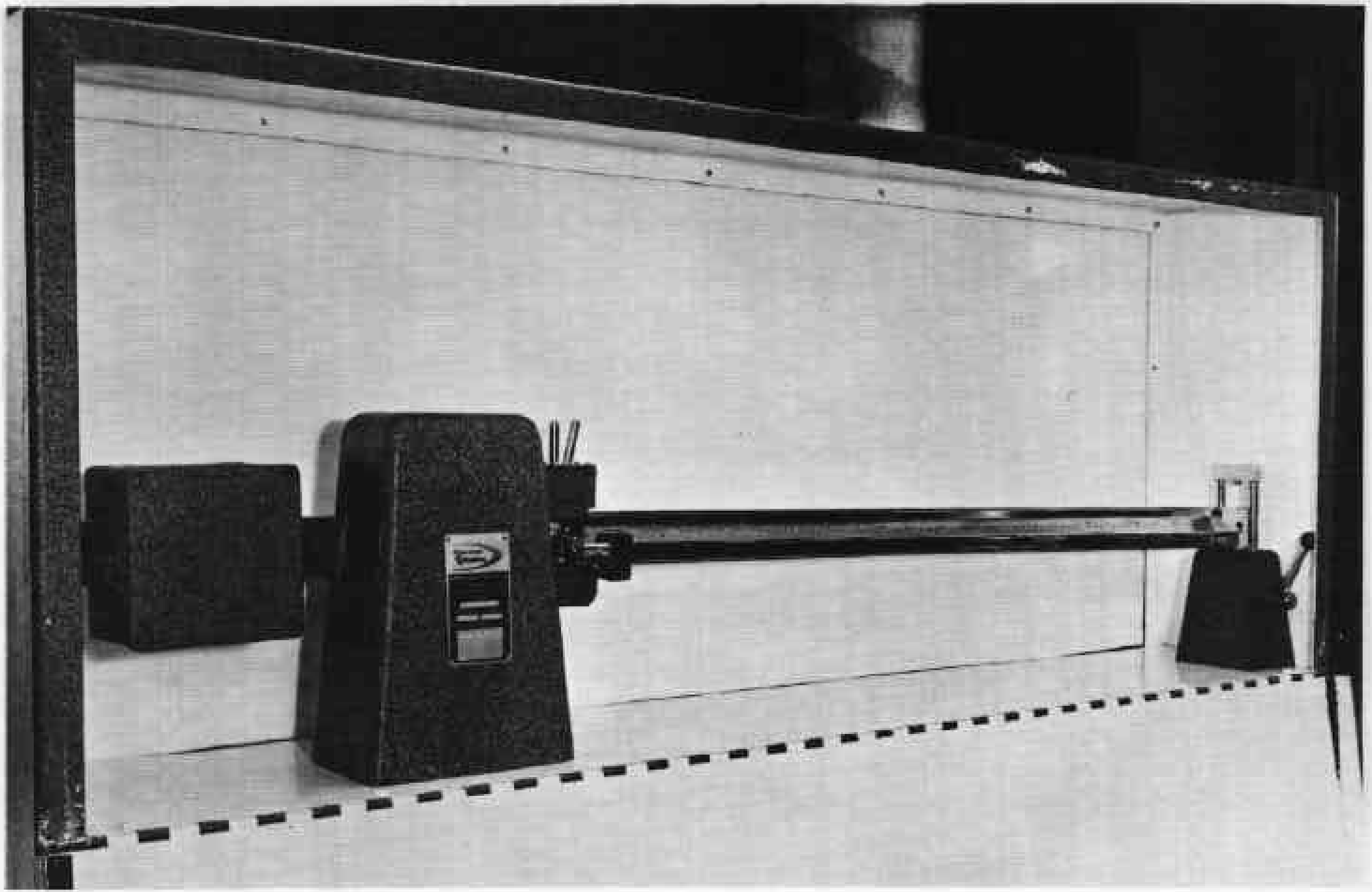
28/4/71

FIGURE 6/10A/1 - 13



Parallel-link Suspension Unit

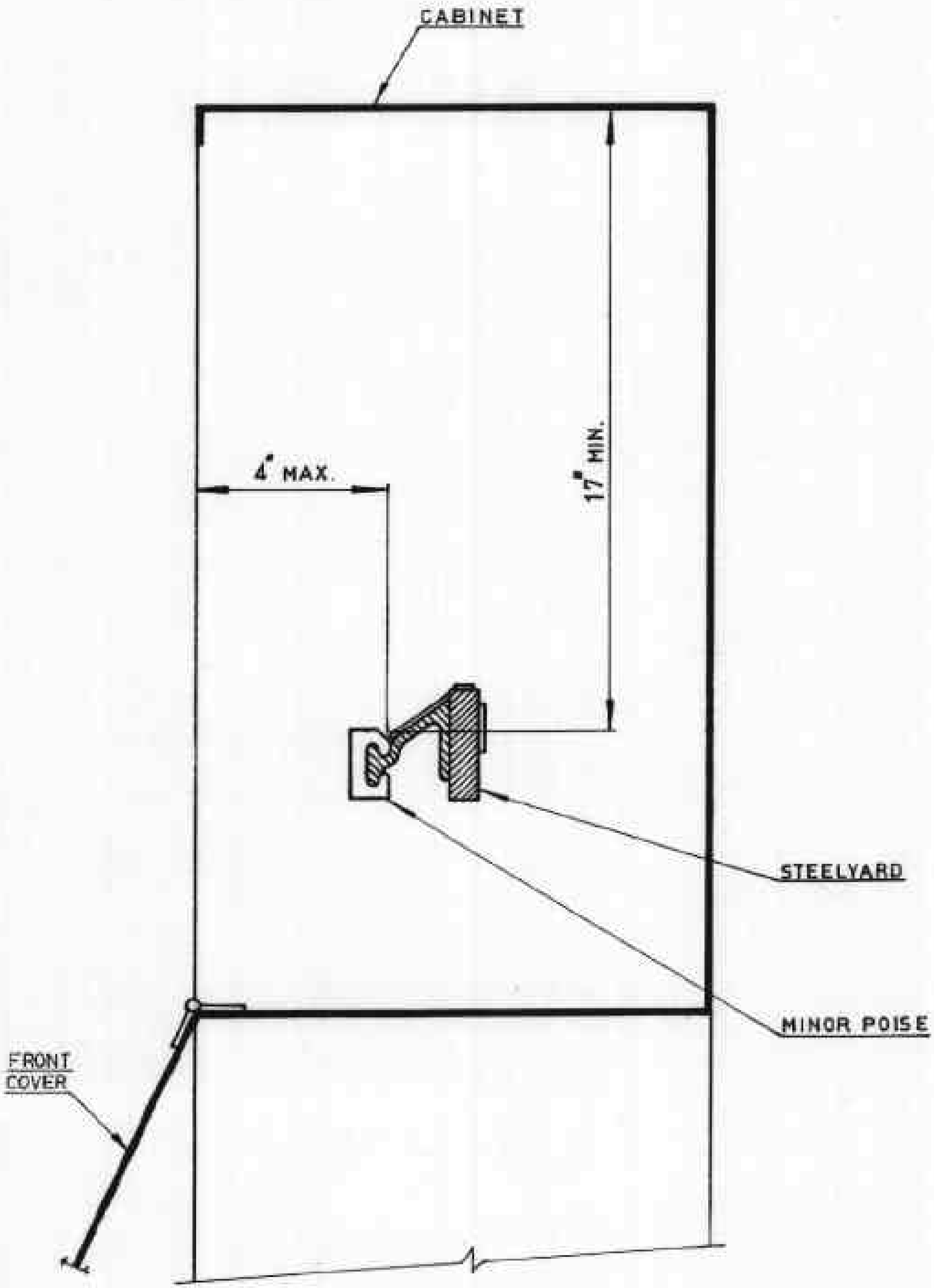
FIGURE 6/10A/1 - 14



Weatherproof Steelyard Enclosure

28/4/71

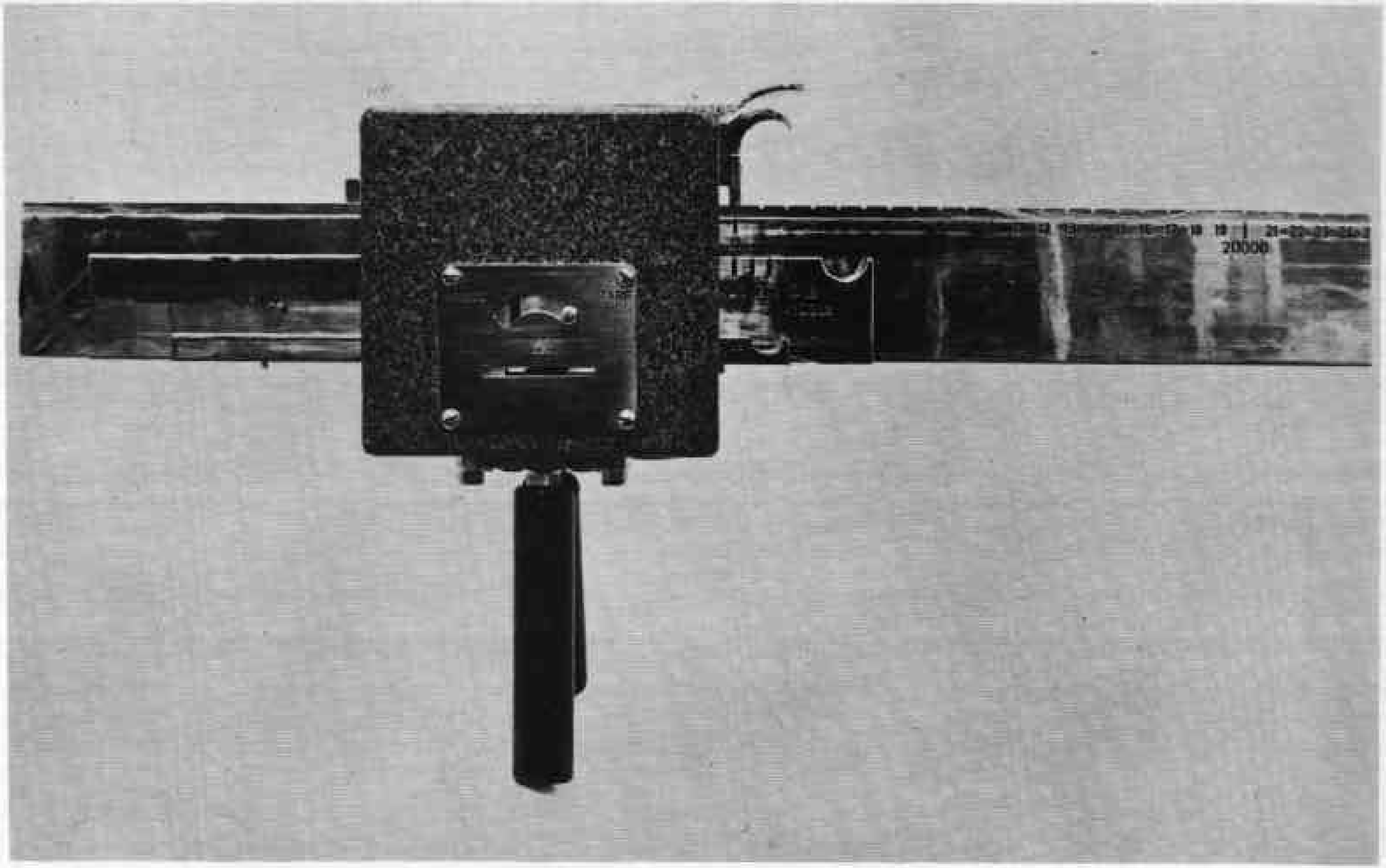
FIGURE 6/10A/1 - 15



Part Section through Weatherproof Steelyard Enclosure

28/4/71

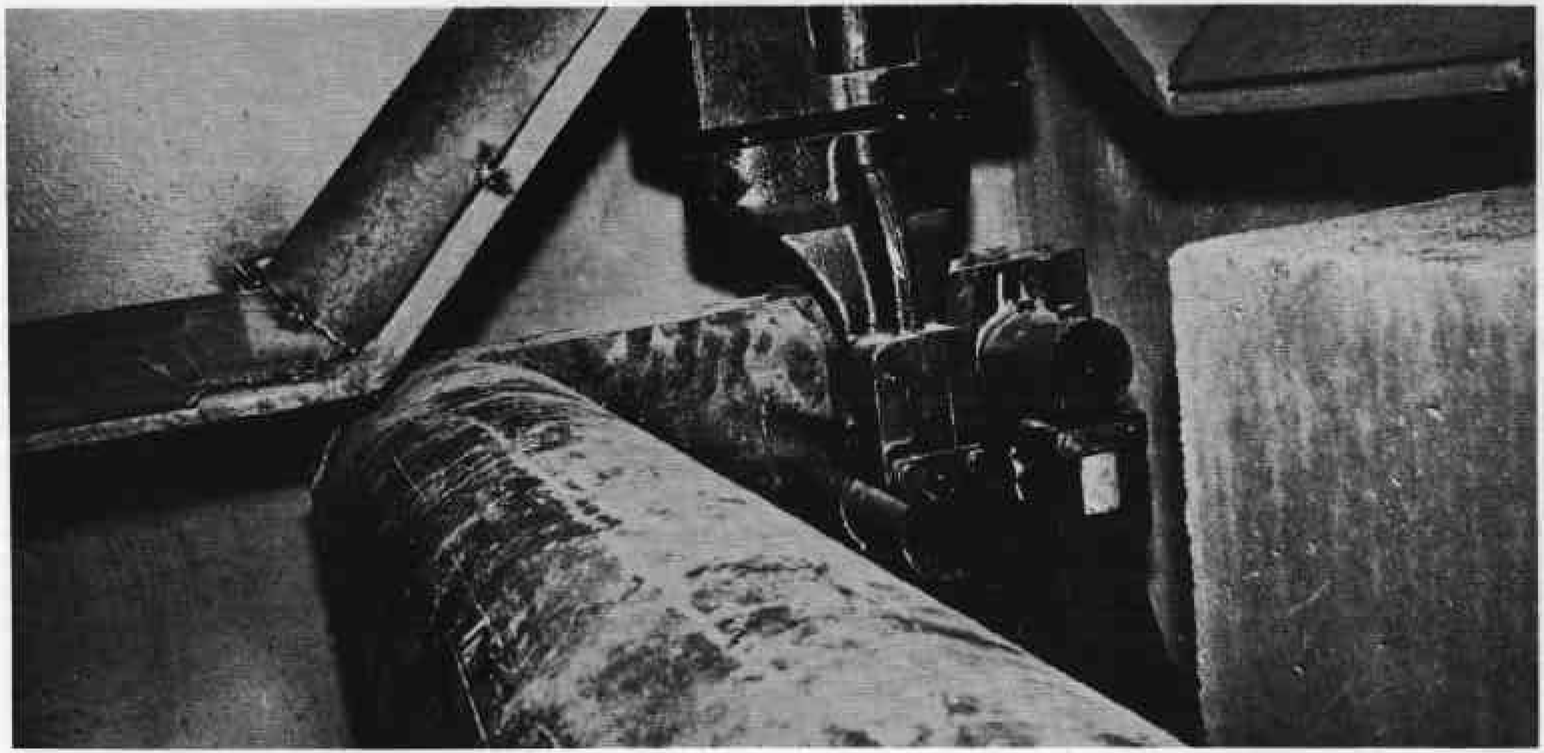
FIGURE 6/10A/1 - 16



Ticket-printing Poise

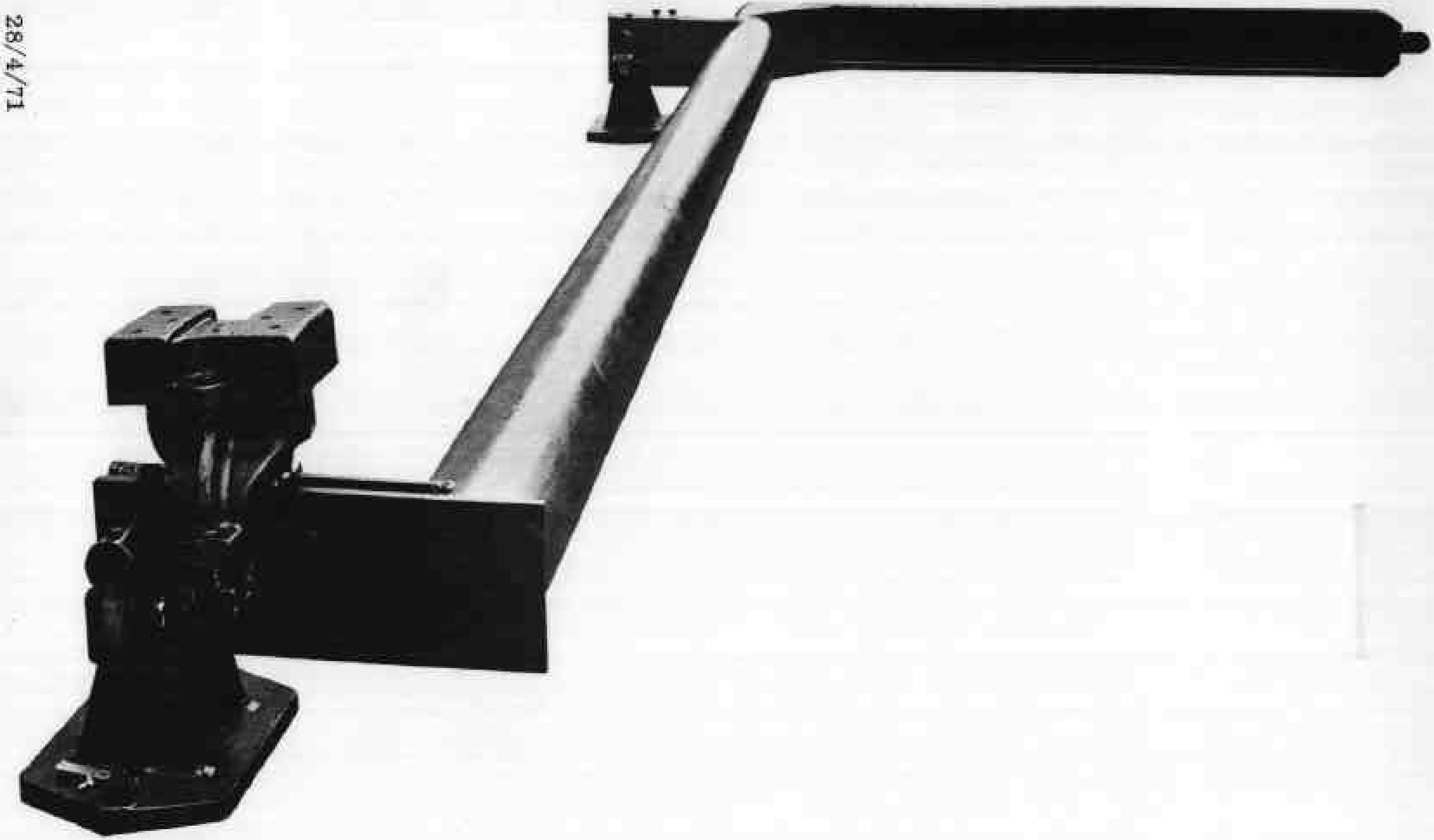
28/4/71

FIGURE 6/10A/1 - 17



Grain-dump Weighbridge Deflector Plates

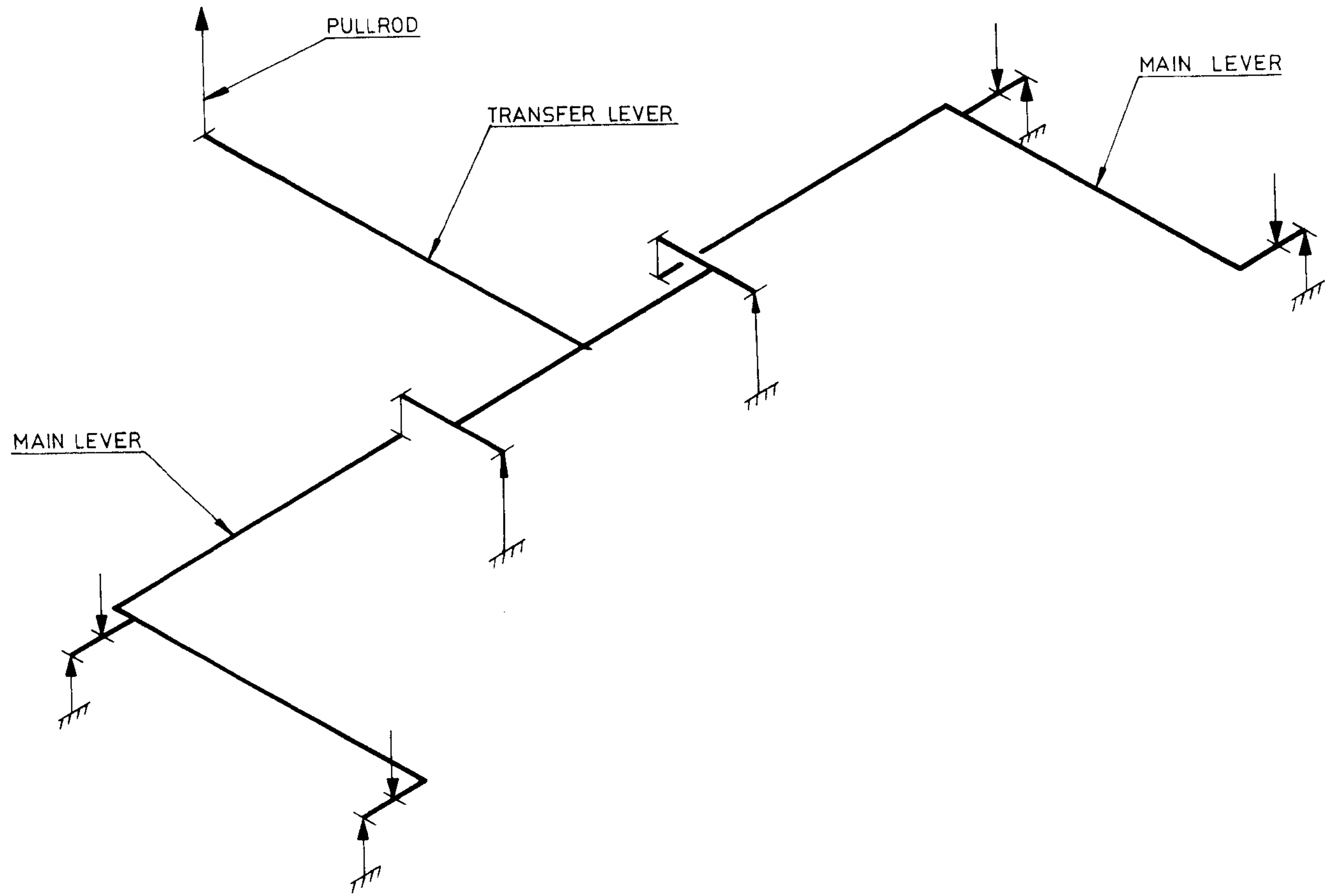
FIGURE 6/10A/1 - 18



Grain-dump Weighbridge — Main Lever

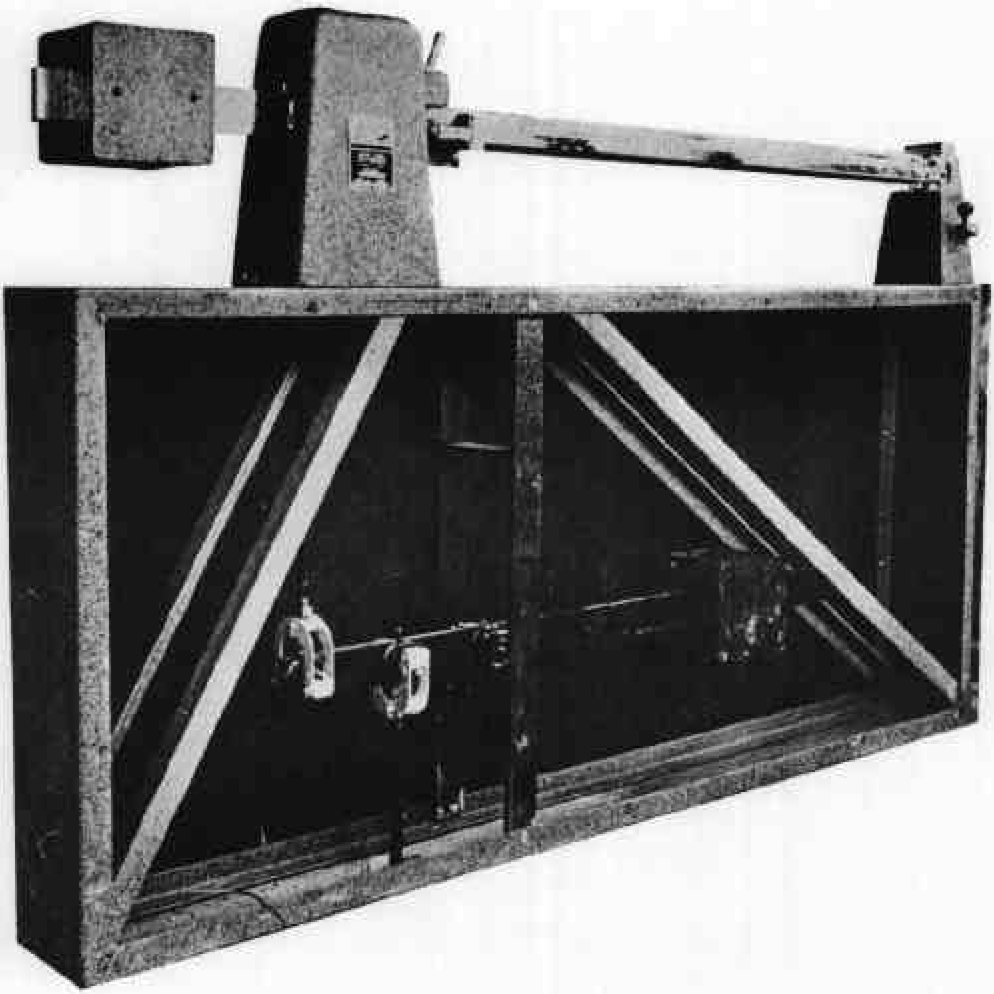
28/4/71

FIGURE 6/10A/1 - 19



Grain-dump Weighbridge — Lever Mechanism

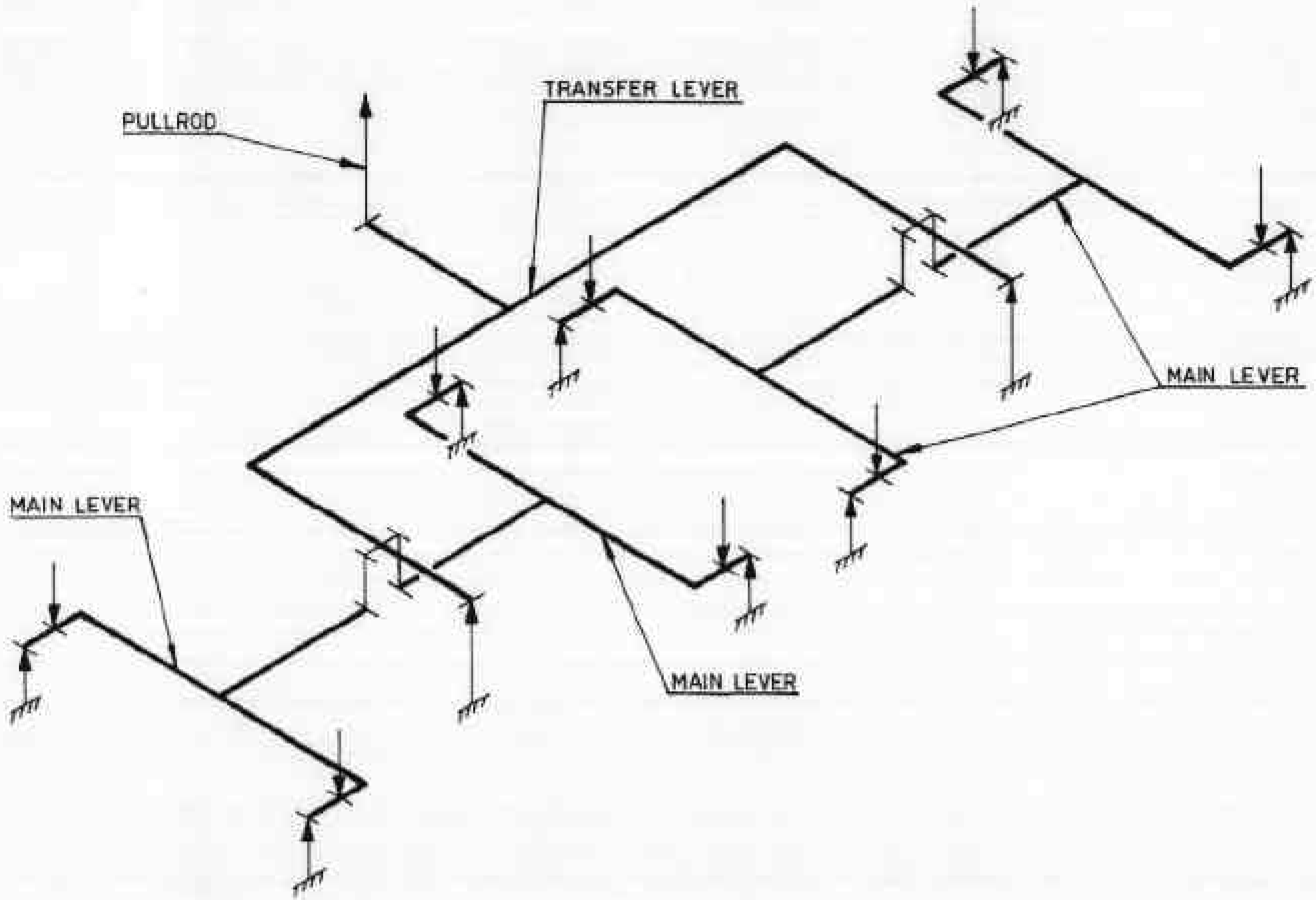
FIGURE 6/10A/1 - 20



Grain-dump Weighbridge Headwork

28/4/71

FIGURE 6/10A/1 - 21



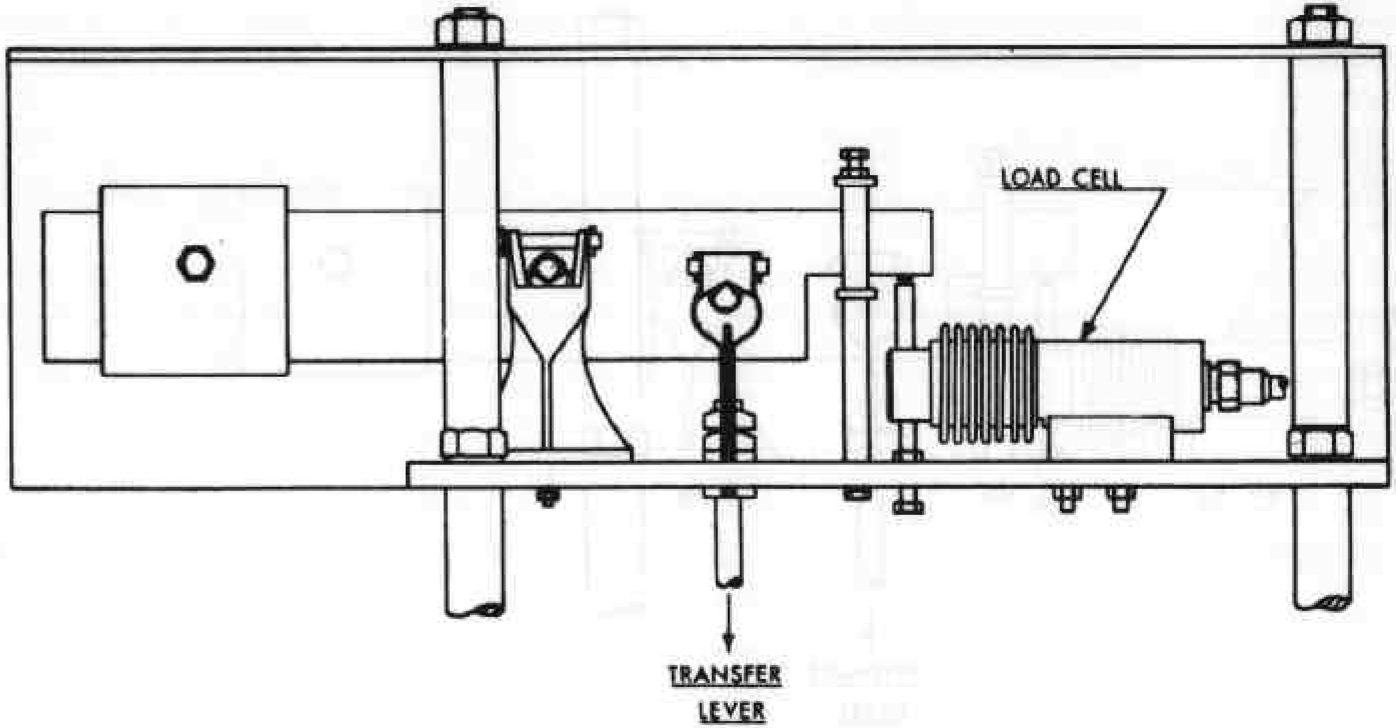
Tandem (Two Baseworks) Weighbridge — Lever Mechanism

FIGURE 6/10A/1 - 22

Transfer-lever Nose-end Knife-edge and Bracket

30/5/74

FIGURE 6/10A/1 - 23



Intermediate Lever and Load Cell - Schematic Diagram

FIGURE 6/10A/1 - 24

Philips PR 1562 Indicator

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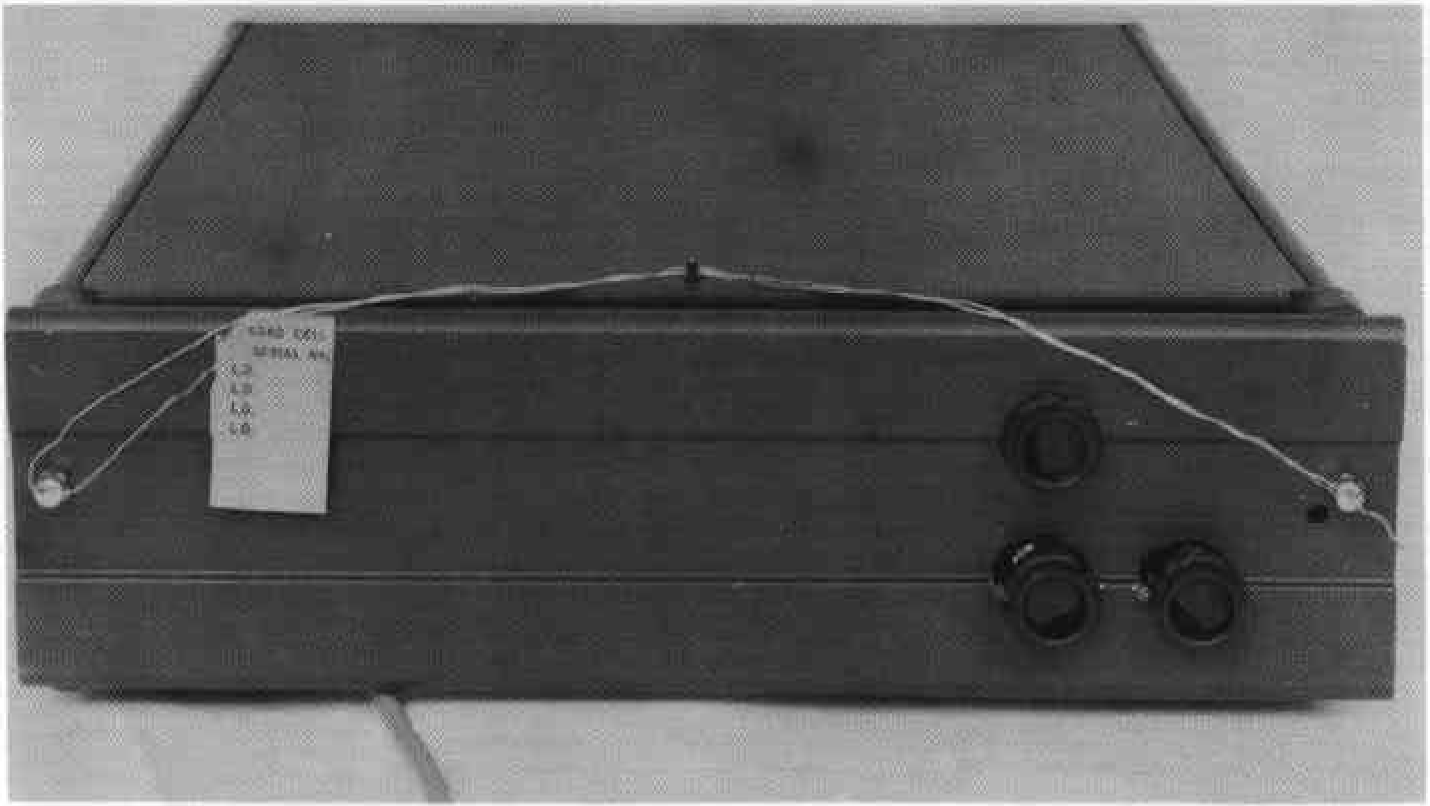
FIGURE 6/10A/1 - 25



Philips PR 1562 Indicator - rear view

Philips PR 1561 Indicator

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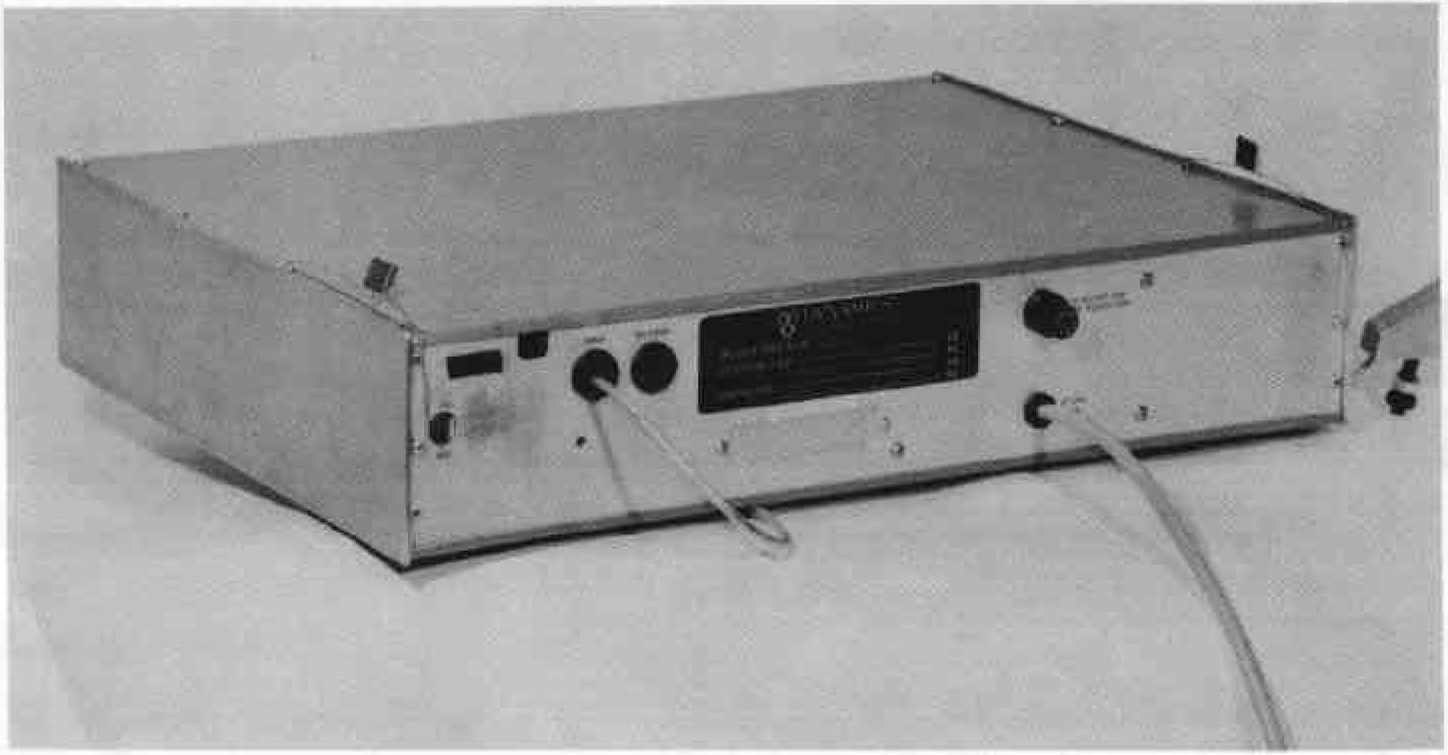
FIGURE 6/10A/1 - 27

Rite-Weigh Dynamic 833G Indicator

FIGURE 6/10A/1 - 28



Dynamic 833G indicator - rear view showing Sealing