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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 6/4C/8

In respect of the pattern of

Sauter Toppan Self-indicating Weighing Instrument of 170.05-g Capacity and Variants.

Submitted by:

Globus-Bizerba Pty Ltd,
122-156 Edinburgh Road,
Marrickville,
New South Wales. 2204.

Manufactured by:

August Sauter KG,
Ebingen (Wurttt),
West Germany.

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 variants were approved on 23 May 1973.

The pattern and variants are marked "NSC No 6/4C/8" and comply with the General Specifications for Measuring Instruments to be Used for Trade, excluding that requirement which relates to automatic range indication.

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This approval is limited to 120 instruments; the location, serial number and model number of each instrument are to be registered with the Pattern Approval Laboratory. #

This Certificate comprises:

Pages 1 to 6 dated 4 June 1973.

Figures 6/4C/8 - 1 to 9 dated 4 June 1973.

Date of issue 4 June 1973.

Signed



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

Inspectors should not verify any instrument conforming to this Certificate until advised in writing by the Pattern Approval Laboratory that these details have been registered.

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DESCRIPTION OF PATTERN

The pattern is a top-loading, multi-range, optical-projection, self-indicating weighing instrument known as the Sauter Toppan Balance Model MAT 160 (see Figure 2). It has a capacity of 170.05 grams, made up of sixteen ranges equivalent to 10 grams each plus 10 grams of tare. It consists of a weighing mechanism and an optical-projection indicator system, the graticule of which is graduated from 0 to 10.05 grams in increments of 0.01 grams. A flash dial (see Figure 7) indicates the selected load range.

The pattern comprises the components tabulated in Column 5 of Figure 1.

DESCRIPTION OF VARIANTS

Variants of the pattern comprise the components tabulated in Column 6 of Figure 1; the capacities are as follows:

Model	Dial capacity grams	Tare capacity grams	Graduation value grams	No. of extra ranges	Range capacity grams	Total capacity grams
MA 80	5.025	0	0.005	15	5	80.025
MAT 80	5.025	5	0.005	15	5	85.025
MA 160	10.05	0	0.01	15	10	160.05
MA 400	50.25	0	0.05	7	50	400.25
MAT 400	50.25	50	0.05	7	50	450.25

DESCRIPTION OF COMPONENTS1. Weighing Mechanism

The weighing mechanism (see Figures 3 and 4) consists of an uneven-arm beam, the fulcrum knife-edges of which pivot on bearings mounted on a sub-frame supported on three columns above the baseplate. A load carrier is supported on the load knife-edges on the short arm of the beam and a compound balance weight, a graticule and a magnetic damping vane are attached to the long arm.

Sensitivity of the beam is altered by the vertical adjustment of the compound balance weight. Coarse and fine adjustment is obtained by the major and the minor poise, respectively.

Each fulcrum and load bearing consists of two polished hardened steel discs mounted side by side and at an angle to each other to form a vee. The discs are self-aligning, each being mounted on two balls within the bearing housings (see Figure 5).

The load receptor is mounted on the top cross-member of the load carrier, which is in the form of a rectangular-shaped yoke; the two side-members support the weights cradle. The bottom cross-member is fitted with a load hook, for weighing hanging loads, and a sector cam over which a fine wire extends to a similar cam, mounted on the sub-frame, to form a parallel linkage with the weighing beam.

A helical-spring resistant is connected between a bracket on the load-carrier side-member and the free end of a cantilevered leaf spring which is mounted on the baseplate. Zero balance is effected by means of a screw adjustment which raises or lowers the leaf-spring end to alter the tension on the helical spring.

2. Optical-projection System

A transparent graticule (see Figure 3) attached to the end of the long arm of the beam has a total graduation range of 1005 graduations over $17^{\circ} 6'$ of arc. An optical-projection system projects the scale on to a green and white coloured ground-glass screen at the top front of the instrument. The line formed by the division of the two colours acts as the indicator. The dust lens consists of a glass plate which has been treated to reflect light in the blue part of the spectrum only. This reduces reflections which would otherwise impede the readability of the indicator.

3. Range-changing Mechanism

The range-changing mechanism (see Figures 3 and 6) is mounted on a framework fixed to the baseplate and is controlled by a knob on the right-hand side of the housing. The knob turns a shaft fitted with cams which raise or lower four weights on rocker arms. The weights are removed from or deposited on the cradle on the load carrier in binary combinations to provide up to

fifteen extra load ranges. The value of the range selected is indicated by a flash dial (see Figure 3) which is coupled by a wire and pulley system to the range-selection mechanism. The total weight is calculated by adding the value indicated on the flash dial to the value indicated on the screen (see Figure 7).

4. Tare Weight Mechanism

A weight, which is normally deposited on the weights cradle (see Figure 3), is lifted by a cam-operated lifting device (see Figure 6) similar to the range-changing mechanism. Depositing and removal of the weight is controlled by a knob on the end of the cam shaft on the left-hand side of the cabinet. "Tare" is indicated by an illuminated notice (see Figure 7) when the knob is turned.

5. Tare Spring Mechanism

A spring resistant is connected between a cantilevered bracket on the load carrier and a sliding carriage mounted on the sub-frame (see Figures 3, 4 and 8). The carriage is raised or lowered by a gear-driven screw feed controlled by a knob on the left-hand side of the housing. It provides continuously variable tare selection. The spring also acts as an additional spring resistant. "Tare" is indicated by an illuminated notice when the knob is turned (see Figure 7).

6. Level Indicator

The level indicator is in the form of two tubular spirit levels at right angles mounted on the right-hand side of the baseplate (see Figure 9).

7. Sealed Cover and Stamping Plug

The mechanism is protected by a housing which is sealed by a wire which passes through the heads of two screws in the front cover plate, and is secured by a lead seal (see Figure 2). The rear cover plate is removable to allow access to the projection lamp and the focusing adjustment.

A stamping plug is provided in the baseplate at the front of the instrument. Its dimensions are 20 mm long and 8 mm wide; the

ends are semi-circular (see Figure 2).

8. Lever-locking Device

A lever-operated crank shaft mounted on the sub-frame causes a centrally pivoted clamp to lift the load and fulcrum knife-edges off their bearings, and clamps the beam in a cradle at the other end (see Figure 4). The action of turning the crank past dead-centre clamps the beam. Locking the mechanism also switches off the power to the projection lamp.

GENERAL NOTES

1. As well as the main weight scale, the pattern and variants may be fitted with a filling scale which is not suitable for use for trade (see Figure 7).
2. Because the submitter is unable to supply the serial numbers of the 120 instruments conditionally accepted by Weights and Measures Authorities, inspectors should advise users requiring verification of an instrument conforming to this Certificate to notify the Pattern Approval Laboratory of its location, serial and model numbers.

Weights and Measures Authorities will be advised immediately the 120 serial numbers have been registered.

FIGURE 6/4C/8 - 1

1	2	3	4	5	6
	COMPONENTS	DATE APPROVED	FOOT-NOTES	PATTERN	VARIANTS
1	Weighing mechanism	23 MAY 73		*	*
2	Optical-projection system	23 MAY 73		*	*
3	Range-changing mechanism	23 MAY 73		*	*
4	Tare weight mechanism	23 MAY 73		*	‡
5	Tare spring mechanism	23 MAY 73		*	‡
6	Level indicator	23 MAY 73		*	*
7	Sealed cover	23 MAY 73		*	*
8	Lever-locking device	23 MAY 73		*	*

- * - indicates required component
- ‡ - indicates optional component

Compatibility Table for Components Described
in this Certificate

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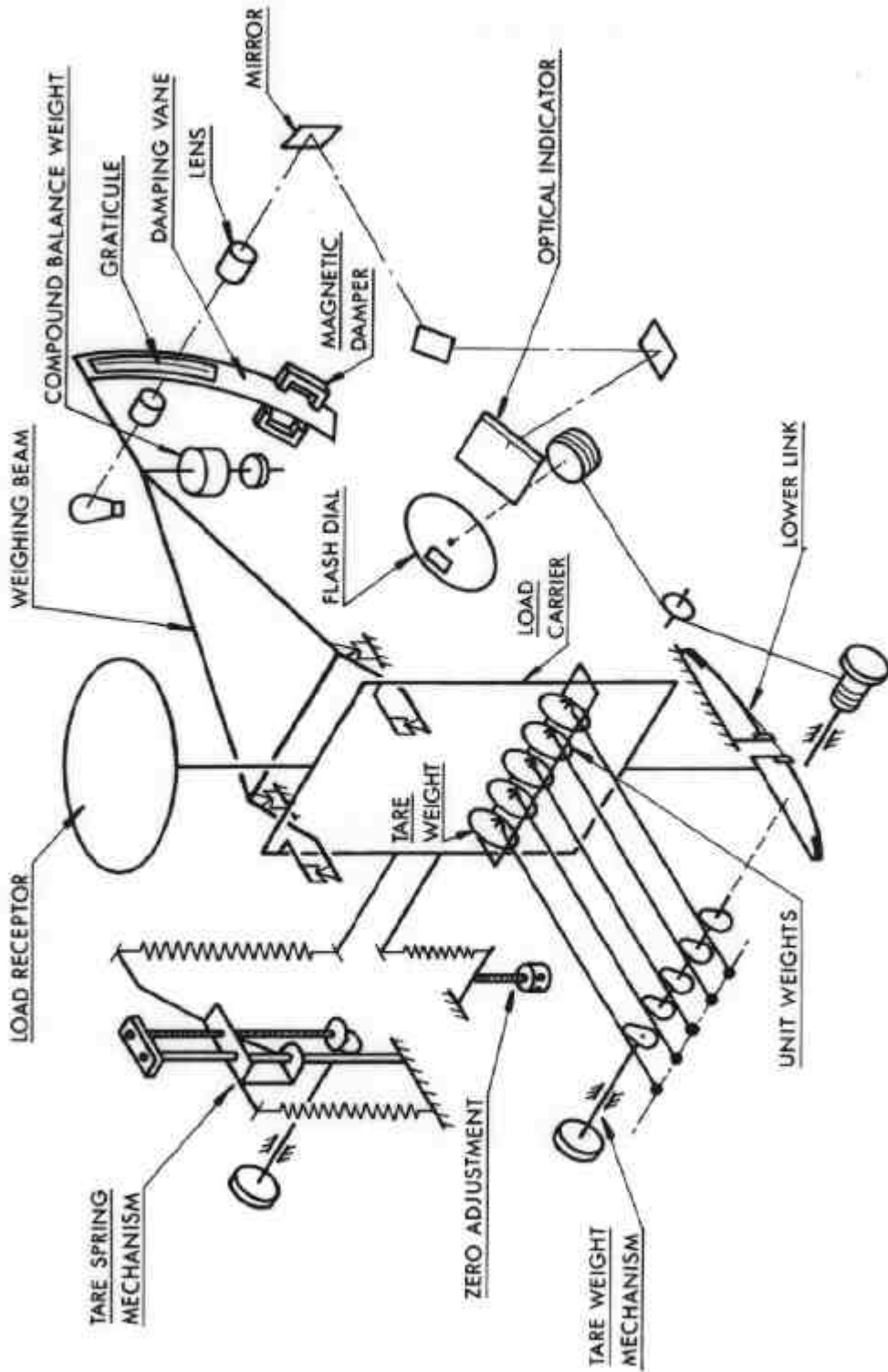
FIGURE 6/4C/8 - 2



Sauter Toppan Balance MAT 160

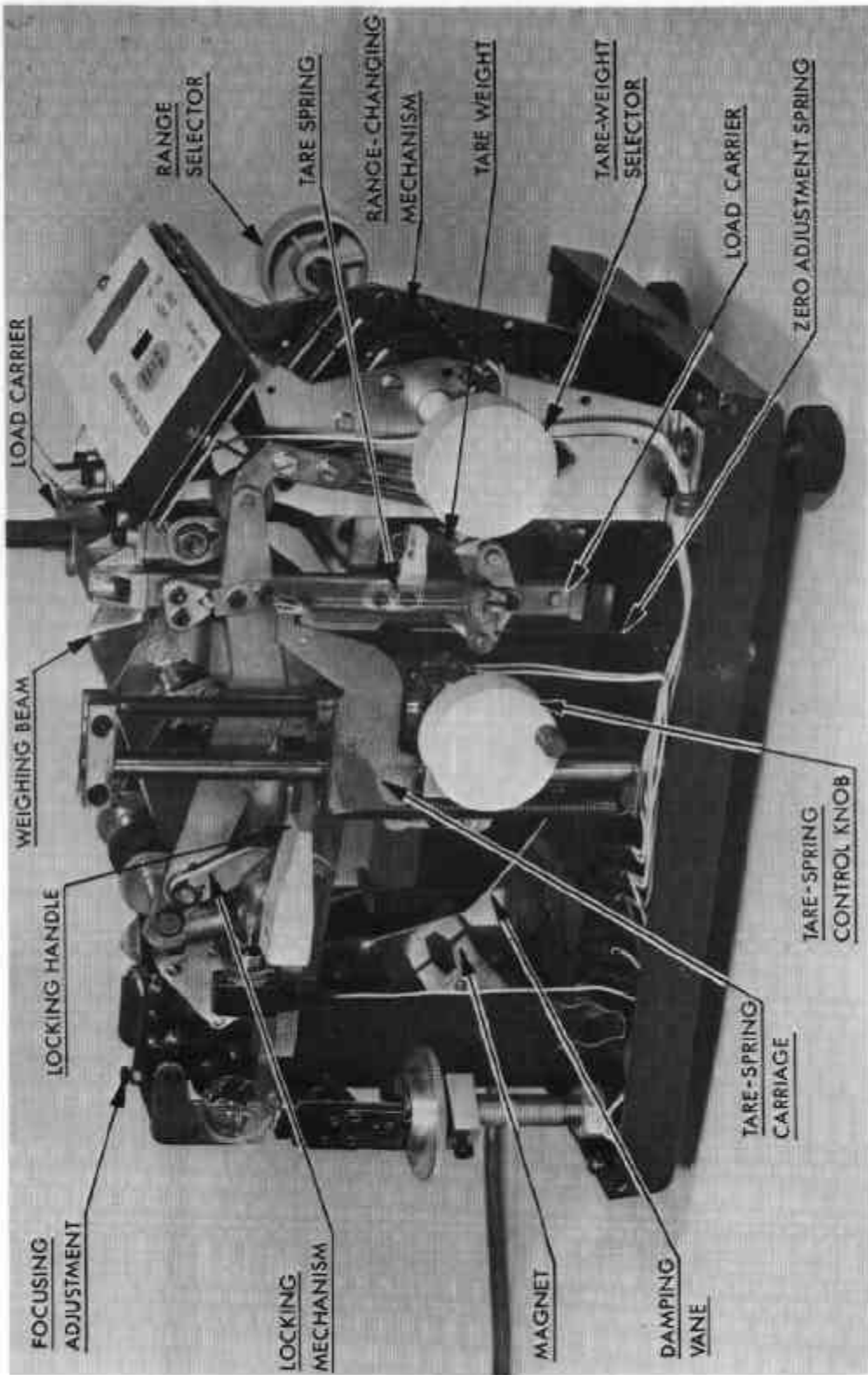
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FIGURE 6/4C/8 - 3



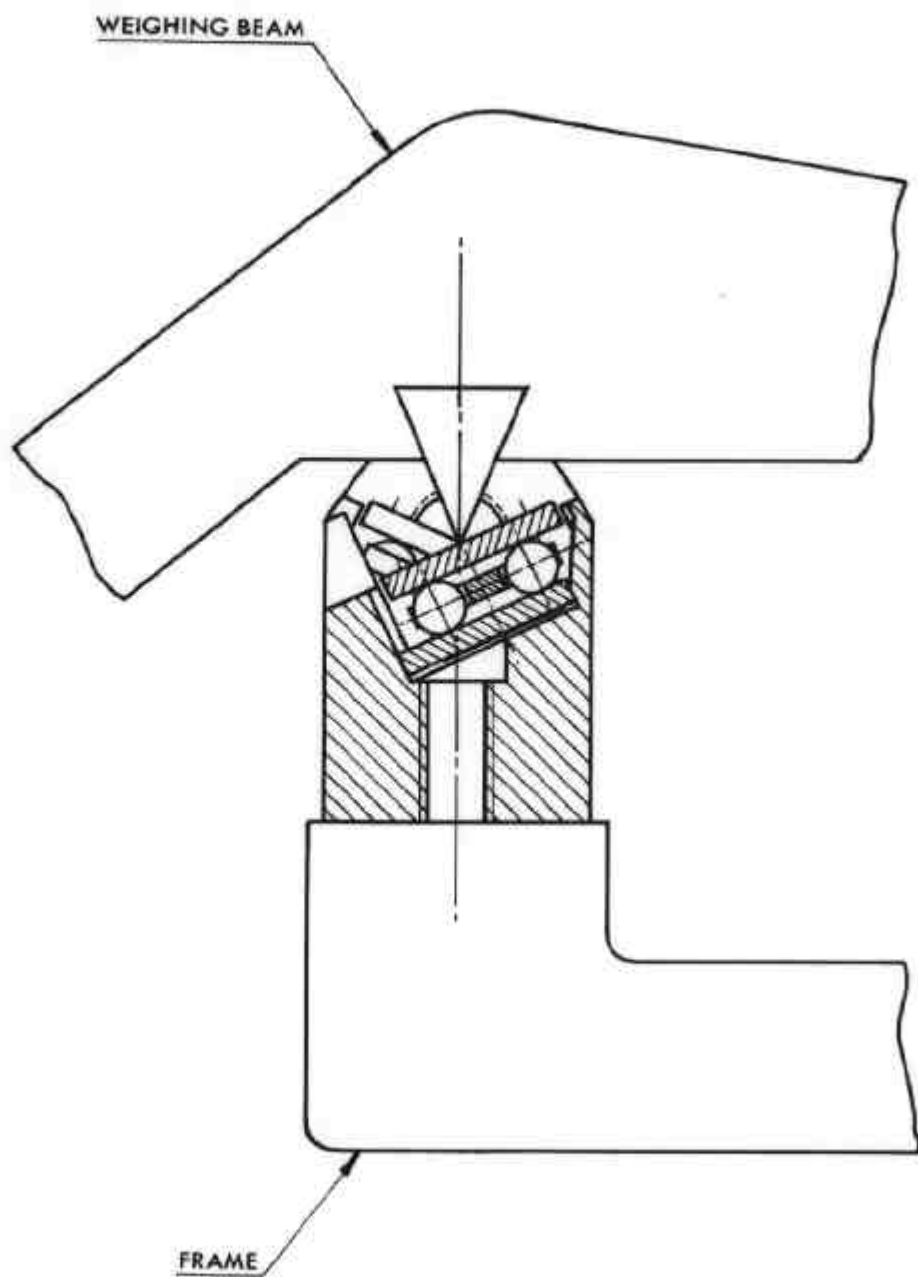
Sauter Toppan Balance MAT 160 Lever Mechanism and Optical-projection System

FIGURE 6/4C/8 - 4



Sauter Toppan Balance MAT 160 — Covers Removed

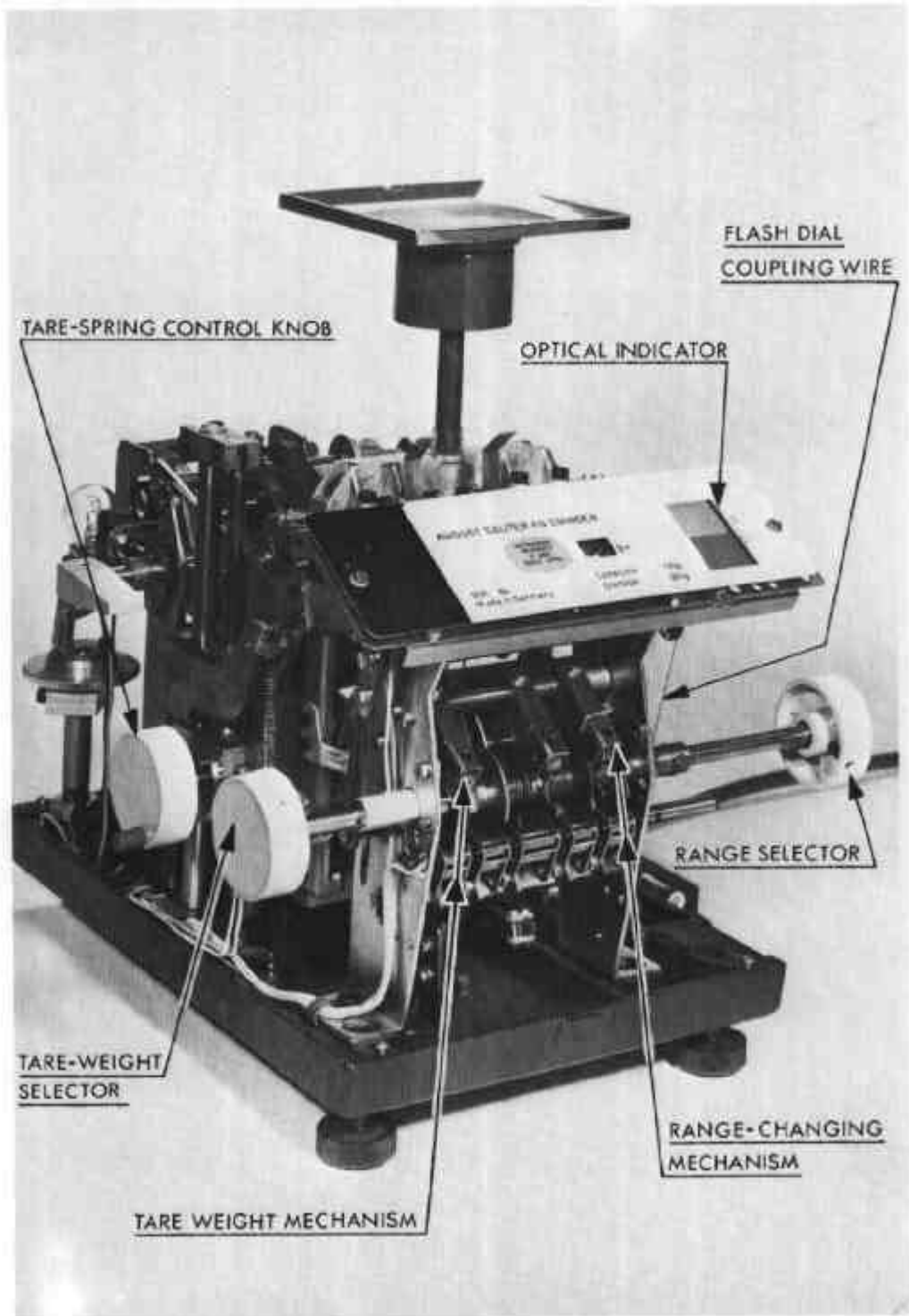
FIGURE 6/4C/8 - 5



Fulcrum Knife-edge and Bearing

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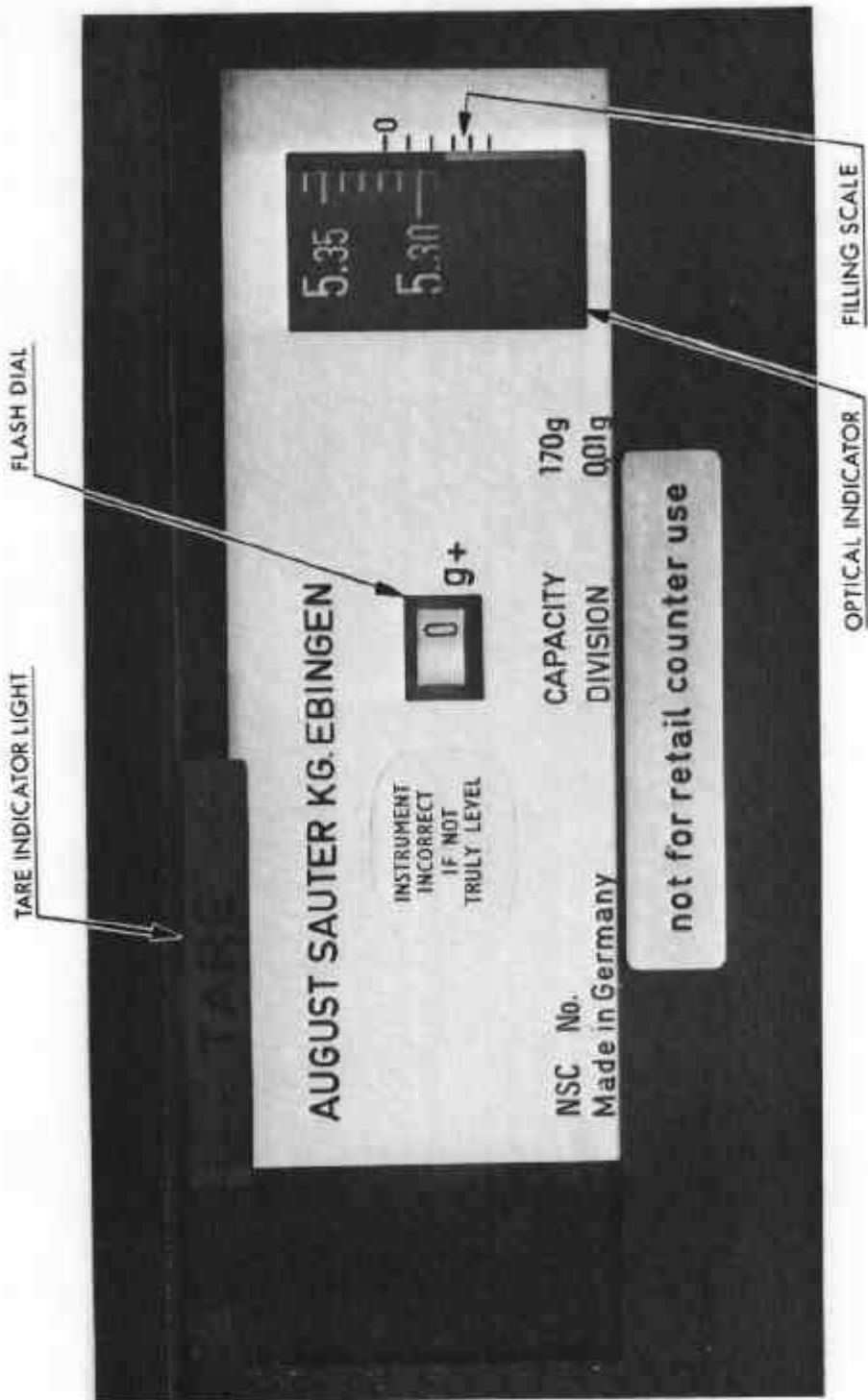
FIGURE 6/4C/8 - 6



Sauter Toppan Balance MAT 160 — Covers Removed

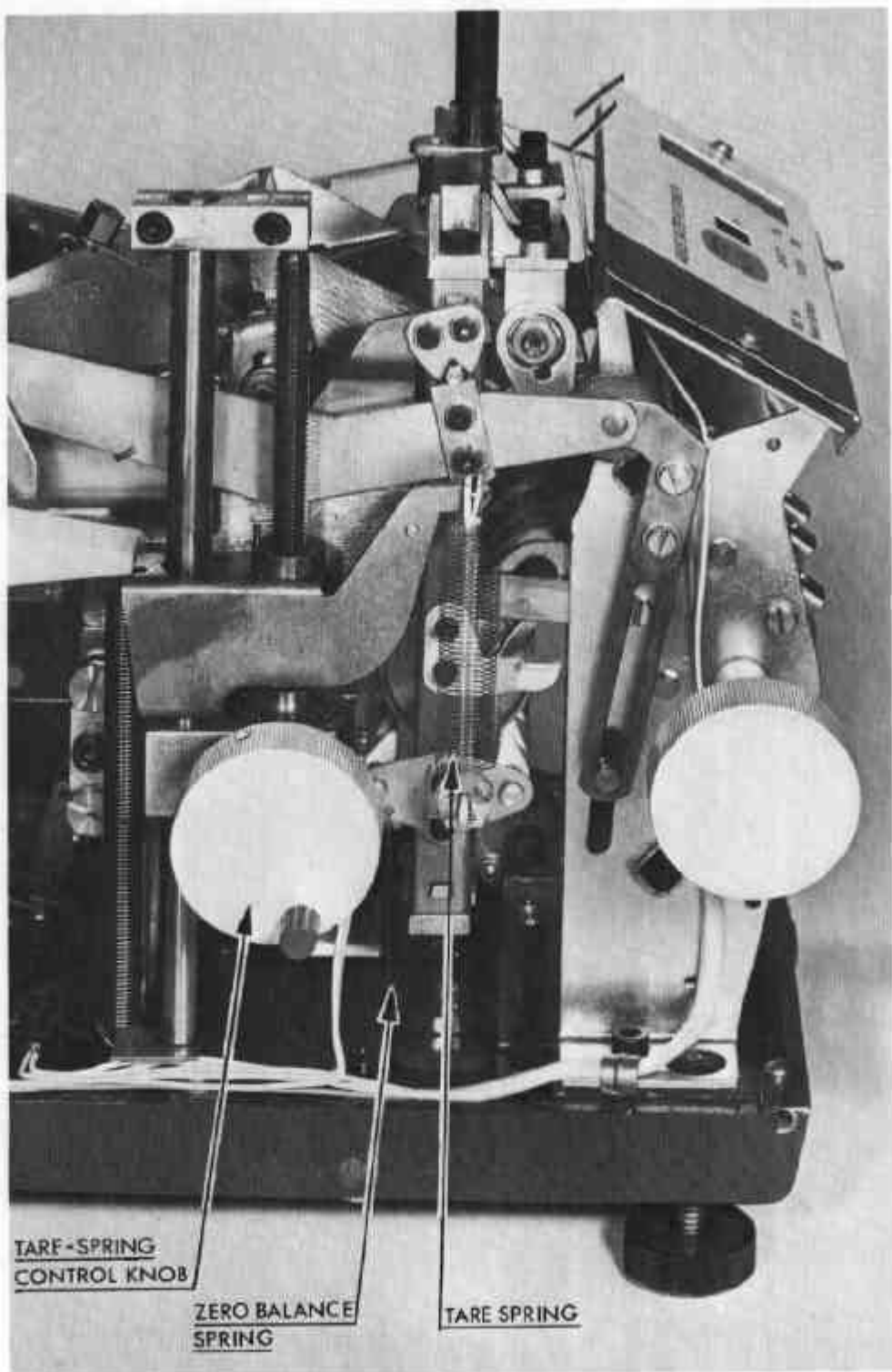
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FIGURE 6/4C/8 - 7



Sauter Toppan Balance MAT 160 Indicator Panel

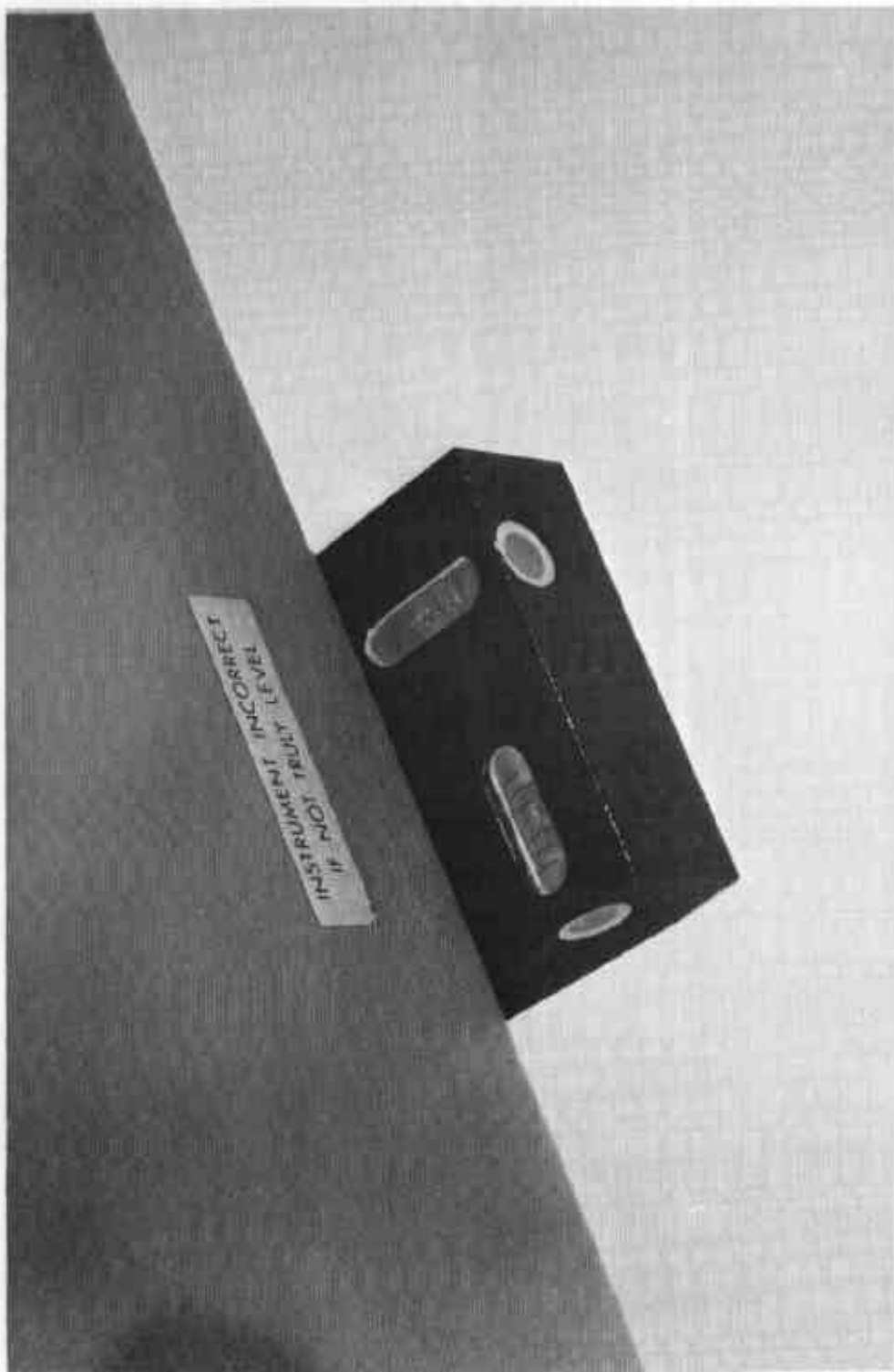
FIGURE 6/4C/8 - 8



Tare Spring Mechanism

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FIGURE 6/4C/8 - 9



Level Indicator

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