THE EVOLUTION OF THE APPARATUS DIMENSIONS IN MEN'S ARTISTIC GYMNASTICS

Has the floor exercise area always been 12 m x 12 m? Has the horizontal bar always been 2.80 m high? Have the landing mats always been 20 cm thick?

This booklet gives you the basic contours of the ever-changing apparatus norms.

It's based primarily on the Olympic rulebooks (OLY Rulebooks), World Championships rulebooks (WC Rulebooks), ISO certificates, and Apparatus Norms booklets.

Note: This booklet does not include the information found in the FIG bulletins and circulars over the years. The Men's Technical Committee could use such publications to make changes or offer clarifications between editions of the Apparatus Norms.

v. 1.0

Photo by RDB/ullstein bild via Getty Images
Many thanks to Hardy Fink for supplying many of the dimensions in this PDF.

FLOOR EXERCISE.

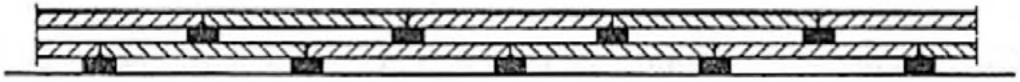
YEAR	SOURCE	DIMENSIONS	NOTES
1936	OLY Rulebook	8 x 8 m	
1938	WC Rulebook	10 x 10 m	At the 1950 FIG Congress, Hungary proposed increasing the floor area to 12 x 12 m. It passed 13 to 2.
1952	OLY Rulebook	12 x 12 m	Space available to the gymnast must be marked out on the ground with white lines. It will consist of a plain floor having at least 14 x 14 m in the case of a raised floor.
1961	Apparatus Norms	IDEM	Double elastic floor of at least 14 x 14 m., covered with a carpet or soft felt of at least 12 x 12 m., which is 5 to 10 mm thick. The layer of felt should have a rubber layer on the floor side to prevent any slippage on the floor.
1965	Apparatus Norms	IDEM	Flexible floor 45 mm thick consisting of 60 plates of 2 m x 1.20 m to be joined together. The plates are of plywood construction with bottom rails and intermediate rails. The surface of each plate is covered with a glued layer of rubber, on which a canvas of resistant quality must be glued.
1974	Apparatus Norms	IDEM	The canvas is replaced by carpet that must be attached to the floor. Underneath there must be a soft layer of rubber that does not exceed 10 mm.
1979	Grossfeld, “Changes during the 110 Years of the World Championships”		In 1979, the first floor with coiled springs was used at an FIG event (i.e. the Fort Worth World Championships). The springs were about 5 cm high.

FLOOR EXERCISE.

YEAR	SOURCE	DIMENSIONS	NOTES
1980	ISO-5907-1980 ISO-5906-1980	12 x 12 m	The dimensions of the floor plates are the same as 1965. “At present, boards for floor exercise consist of an elastic layer of rubber or similar material fixed onto a box-frame construction made of plywood or similar material. It was decided not to give a more detailed description of the design in order to not violate existing patent rights and restrict development.” The floor covering is a series of mat-strips: 1,200 cm long x 150 cm wide x 2 cm high – or – 1,200 cm long x 200 cm wide x 2 cm high. A safety zone of 1 m shall be provided around the surface for floor exercises. It shall have the same material characteristics as the floor area and shall be clearly marked in a distinct color.
1989	Apparatus Norms	IDEM	There are sloping and non-sloping options for the safety zone. (See images.) Safety Border: Width: 100 cm min. Horizontal Area: 50 cm min. Slope: 20% maximum Height of outer border: 3.5 cm maximum Maximum height of floor if a sloped border is used: 13.5 cm (See diagrams on the following pages.) Strip for out of bounds: 5 cm, with the outer edge of the strip corresponding to the outer border of the 12 m performance area.

FLOOR EXERCISES (MEN AND WOMEN)

(EXERCICE AU SOL [HOMME ET DAMES])



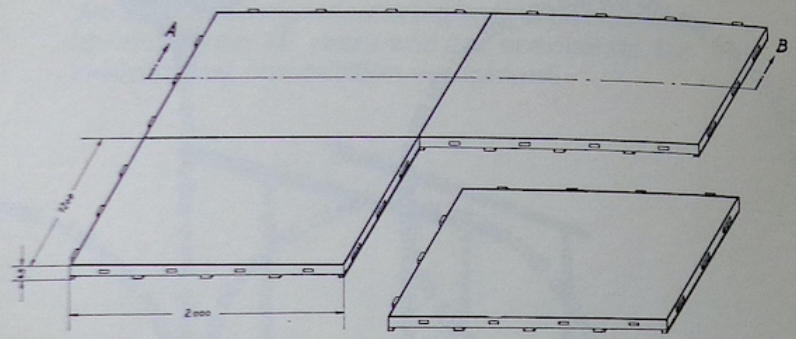
1. For the floor exercises we recommend a double elastic floor (see drawing) covered with a soft material.

2. While awaiting further experiments, a felt mat 12,000 x 12,000 mm and 5-10 mm thick should be made available. If desired, the mat should be covered with a canvas. The felt mat should have a rubber layer on the floor side to eliminate slipping.

3. For the floor exercises, a platform of at least 14,000 x 14,000 mm should be prepared, on which the 12,000 x 12,000 mm competitive area should be distinctly marked.

1961, Apparatus Norms, printed in the AAU Gymnastics Guide, 1962-1963

Ground-work
(men and women)



Organisers of F. I. G. competitions or similar competitions must provide a flexible board (floor) with the following measurements and specifications.

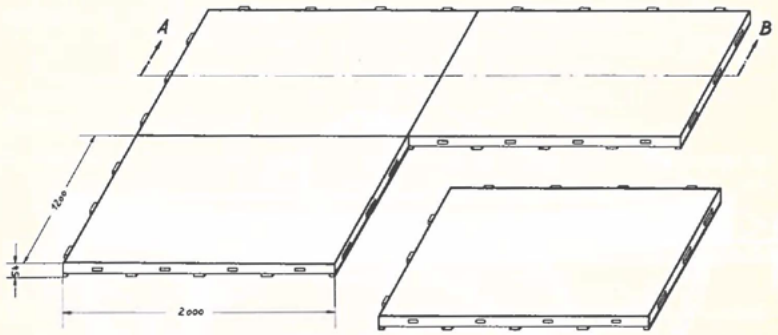
1. 12 000 × 12 000 × 45 mm consisting of 60 sections 2000 × 1200 × 45 mm joined together by means of lugs and corresponding slots.
2. The sections to be made of laminated wood with an intermediate cross beam and bottom rails. Each layer must be joined in such a way that the flexibility is uniform at any point on the surface.
3. The surface of each section must be covered with a layer of rubber glued on and over this there must be stuck a layer of firm strong cloth. (This is in order to avoid having to cover the whole 12 × 12 m with one cover, and also to enable the sections to be made up into a smaller area — 10 sections of 1200 × 2000 or 6 sections of 2000 × 1200 mm.)
4. This floor area, made of 60 sections, must be fitted in a framework of lengths of wood, 100 mm wide and 45 mm high, its upper surface oblique measuring from 45 mm to 0 mm at the bottom and outside.
5. This flexible flooring must be placed within an area measuring 14 000 × 14 000 mm.

6. This flexible flooring is also recommended for international meetings. If, because of the situation or other reasons, this is not possible, the organiser must provide a felt carpet or carpet of similar material, thick enough to deaden falls without prejudicing the stability of held positions. This carpet must be able to take a cover if necessary. The felt layer must be made in such a way as to prevent any slipping on the ground. The area alloved for the gymnast (12 000 × 12 000 mm) must be clearly marked out.

NB. Other details and specifications of the flexible flooring described under points 1 to 5 may be obtained manufacturers from the Technical President of F. I. G.

1965, Apparatus Norms – Thanks to Hardy Fink for supplying this image.

Double flex floor
for men and women



Organizors of FIG Competitions, or similar competitions, must provide the Double Flex Floor with the following measurements and characteristics:

1. Floor: 12000×12000×54 mm, consisting of 60 individual sections of 2000×1200×54 mm, joined together by lugs and corresponding slots.
2. These sections are constructed of plywood plates with rubber base. These layers must be joined in such a manner that each individual section has the same flexibility at any point of the upper surface.
3. The surface of each section must be covered with a soft layer of rubber, or any other material with the same traits.
   For safety reasons, the soft layer may not exceed a thickness of 10 mm. The soft layer must be covered with a carpet like material of good quality. The soft layer as well as the carpet must be attached to the underconstruction. This method will prevent having to stretch a rug over the entire surface and also enable the sections to be made up into smaller sections of 2000×12000 mm or 1200×12000 mm.

Double flex floor
for men and women

4. The double flex floor, made up of 60 individual sections, is held together with a wire rope tension with a minimum border of 500 mm wide. This border runs wedge shaped from outwards as far as floor height of 54 mm. To distinguish the actual floor area the gymnast uses, the border must be of a distinct different color.
5. If this floor is intended to be on an elevated podium, the area it is placed in must measure 14000×14000 mm.
6. The use of this floor is also recommended for **International Competitions**, if that is impossible however, due to lack of space or other reasons, the organizor must provide a felt carpet or one of similar quality, to deaden the falls of the gymnast, without prejudicing the stability and balance of a held position.
   This alternative solution must be as similar to the double flex floor as possible.
   The actual floor area must be clearly marked.

1974, Apparatus Norms

FIG APPARATUS NORMS

1.) FLOOR

2.) Use

For Floor Exercises in Artistic Gymnastics.

3.) Form

Performance Area:

Its surface must be horizontal, even and without gaps.

It can be higher or at the same height as the surrounding floor.
The height depends on the slope and width of the surrounding safety border.

Safety border:

It surrounds and borders the Performance area, distinctly and without gaps.

Measured from the performance area, up to 50 cm of its width extends horizontally, evenly and at the same height as the performance area.

The remaining width is sloped, up to a maximum of 3.5 cm in relation to the surrounding floor, naturally only, if there is a difference in height between the performance area and the surrounding floor.

The slope may not exceed 20 %.

The surrounding Floor

Measured from the outer border of the performance area, it must extend horizontally, evenly and without gaps for at least 200 cm.

FLOOR EXERCISE AREA

4.) Measurements

Performance Area:

Length and Width	1200 cm x 1200 cm * 3 cm
Height (in respect to surrounding area)	
In case of a 50 cm inclination border, the height is	13.5 cm maximum

If this height is exceeded, the border must be wider, since the slope may not exceed 20 %

Safety border

Width	100 cm minimum
Horizontal Area	50 cm minimum
Slope	20 % maximum
Height of outer border	3.5 cm maximum

Elimination Strip

Width	5 cm * 0.5 cm

The outer edges of the elimination strip must correspond with the outer border of the 1200 cm performance area.

5.) Adjustments

Not applicable.

6.) Functional Properties

Elasticity:

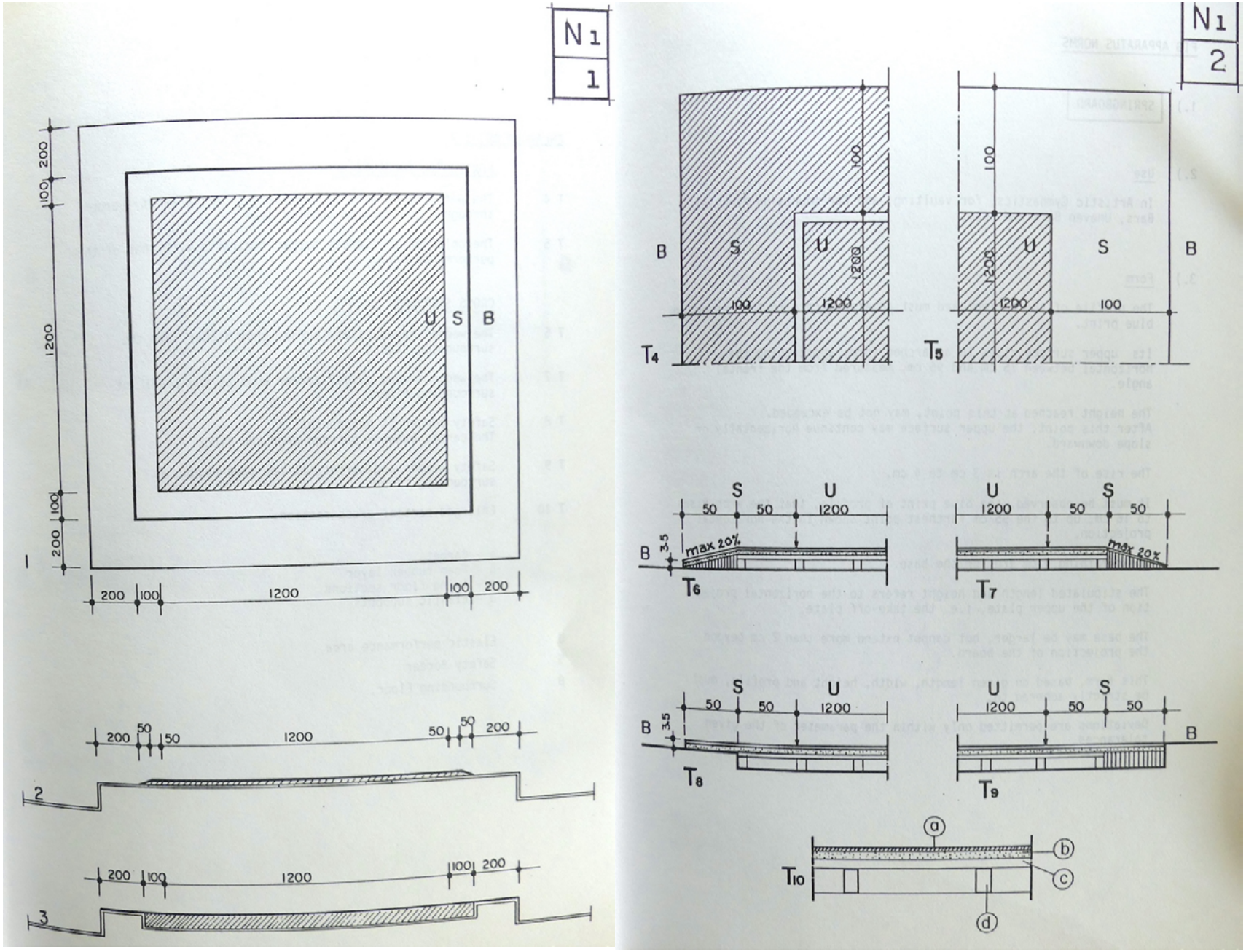
The performance area, at all points, must have a practical evenly distributed surface elasticity.

Absorbance

The performance area must reduce motion energy and have a dampening effect.

The safety border too, should possess these traits, at least up to a width of 50 cm, measured from the performance area.

1989, Apparatus Norms – Thanks to Hardy Fink for supplying this image.



1989, Apparatus Norms – Thanks to Hardy Fink for supplying this image. Note: The thicknesses and types of materials (i.e. carpet, wood, springs, etc.) are not specified in the document.

POMMEL HORSE.

YEAR	SOURCE	HEIGHT OF HORSE	LENGTH OF HORSE	WIDTH OF HORSE	HEIGHT OF POMMELS	LENGTH OF POMMELS	WIDTH B/T POMMELS	DIAMETER OF THE GRIP	OTHER
1912	OLY Rulebook	1.30 m	2.0 m		12-15 cm		40-45 cm	31-35 mm	
1920	OLY Rulebook	Chest Height							
1924	OLY Rulebook	1.40 m (to the pommel crests)	1.90 m	40 cm			42 cm		
1928	OLY Rulebook	1.20 m (to the top of the pommels)	1.80 m	35 cm	12 cm		39-42 cm	30 mm	Wood pommels
1932	OLY Rulebook	IDEM	IDEM	IDEM	IDEM		40-42 cm		
1936	OLY Rulebook	1.10 m	IDEM	35-37 cm	IDEM		IDEM	35-37 mm	Polished wood pommels The upper horizontal part has a length of approx. 8 cm
1938	WC Rulebook	1.20 m (to the top of the pommels)	IDEM	IDEM	IDEM		42 cm	31-35 mm	IDEM

POMMEL HORSE.

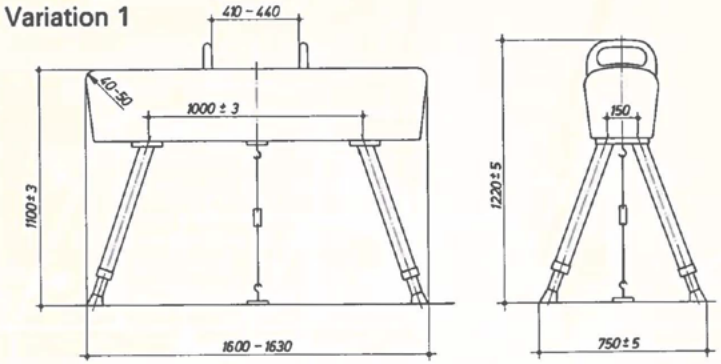
YEAR	SOURCE	HEIGHT OF HORSE	LENGTH OF HORSE	WIDTH OF HORSE	HEIGHT OF POMMELS	LENGTH OF POMMELS	WIDTH B/T POMMELS	DIAMETER OF THE GRIP	OTHER
1952	OLY Rulebook	1.20 m (to the top of the pommels)	1.8 m	35-37 cm	12 cm		40-45 cm		Polished Wood Pommels The upper horizontal part has a length of approx.5-6 cm
1960	OLY Rulebook	1.10 m (to the top of the horse)	1.6 m	35 cm	IDEM	28 cm	IDEM	34 mm	Their upper portion is horizontaly slightly convex for a length of at least 6 cm.
1974	Apparatus Norms	IDEM	IDEM	35 cm (Top) 28 or 30 cm (Base)	IDEM	31 cm	41-44 cm	IDEM	Pommels: Wood, artificial leather with traits of wood, or artificial materials Cover: Top quality cow hide leather or artificial leather

POMMEL HORSE.

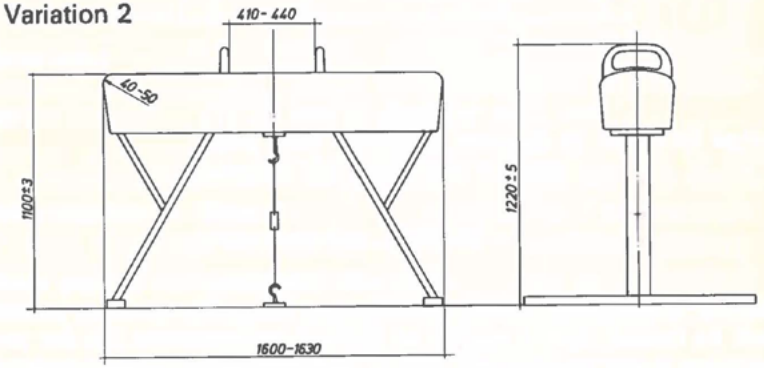
YEAR	SOURCE	HEIGHT OF HORSE	LENGTH OF HORSE	WIDTH OF HORSE	HEIGHT OF POMMELS	LENGTH OF POMMELS	WIDTH B/T POMMELS	DIAMETER OF THE GRIP	OTHER
1987	Apparatus Norms	1.10 m from floor for 6 cm mats 1.16 m from floor for 12 cm mats							
1989	Code of Points	1.15 m (from floor to the top of the horse)							
2006	Apparatus Norms	IDEM	1.6 m (Top) 1.55 m (Base)	35 cm (Top) 30 cm (Base)	12 cm	31 cm along the base	40-45 cm	34 mm	Horse: Its support area must be elastic and absorbing. The side surfaces, as well as corners and edges, must have a dampening effect. Indentations caused by support may not hinder turns of the palms. Cover material cannot tear, slip, or wrinkle. Pommels: Made of a stiff material.

Pommel horse

Variation 1



Variation 2



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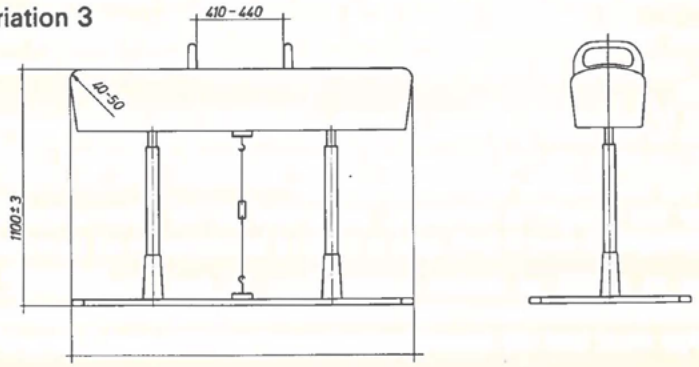
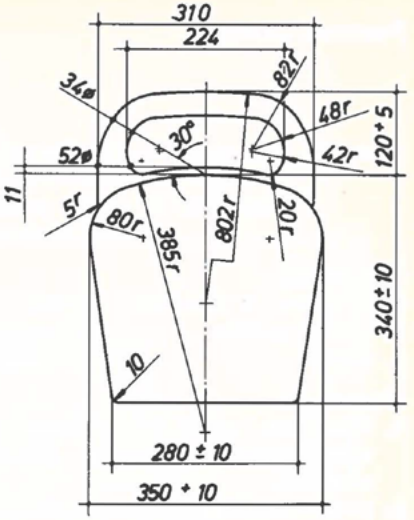
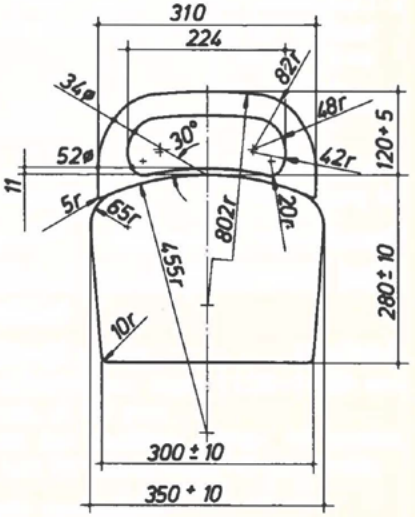


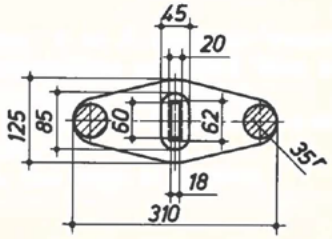
Pommel horse

Variation 1



Variation 2 and 3





1974, Apparatus Norms

RINGS.

YEAR	SOURCE	HEIGHT OF PORTICO	HEIGHT FROM FLOOR	INTERIOR DIAMETER	THICKNESS	DISTANCE B/T RINGS	OTHER
1908	OLY Rulebook		`1.829 m (6 feet)				Circular rings with turnstiles
1909	Slovenski Sokol, Jan. 1909; Sokol, 1909, 8-9; Olympische Turnkunst, June 1967		2.40 m				Note: They were originally iron rings, but the Czechs swapped them out for wood rings. Round or triangular, according to the gymnast's preference.
1912	OLY Rulebook		IDEM				Round rings
1924	OLY Rulebook		2.30 m	17.5 cm	22-23 mm	0.50 m	
1928	OLY Rulebook	5.50 m	2.50 m	18 cm	28 mm		Wooden rings
1936	OLY Rulebook	IDEM	2.40-2.50 m	IDEM	IDEM		IDEM
1938	WC Rulebook	IDEM	2.50 m	IDEM	IDEM		Polished wood rings

RINGS.

YEAR	SOURCE	HEIGHT OF PORTICO	HEIGHT FROM FLOOR	INTERIOR DIAMETER	THICKNESS	DISTANCE B/T RINGS	OTHER
1952	OLY Rulebook	5.50 m	2.40 m	18 cm	28 mm		For the tall gymnasts, a tolerance like high bar (i.e. 2.50 m). A special device will prevent the twisting of the ropes.
1960	OLY Rulebook	IDEM Width of Portico: 2.80 m	2.50 m	IDEM	IDEM	About 50 cm	The rings are suspended by hemp ropes of 12-13 mm. diameter or by metal cables of 5-6 mm. diameter. The rings are attached to the ropes by means of leather straps or bands sewed together at the two extremities. Length: 700 mm.; width: 35 mm.; and thickness: 4 mm. A special device placed between the frame and the ropes, not weighing more than 600 gr., will prevent the ropes from twisting. The guy wires are fixed to the ground at lateral distances of 1.30 m. and transversal distances of 2 m. from the foot of the uprights. (Total lateral distance between fixed points in the floor: 5.50 m; total transveral distance between fixed points on the floor: 4.0 m)

RINGS.

YEAR	SOURCE	HEIGHT OF PORTICO	HEIGHT FROM FLOOR	INTERIOR DIAMETER	THICKNESS	DISTANCE B/T RINGS	OTHER
1974	Apparatus Norms	5.50 m Width: 2.80 m	2.55 m	18 cm	28 mm	50 cm	Portico must be conical in shape. (The 1965 Apparatus Norms allowed for a conical portico but did not mandate one.) Support chains made of steel, zinc. (Distances of the cables the same as 1960.)
1987	Apparatus Norms		2.69 m for 12 cm mats 2.75 m for 18 cm mats				
1989	Code of Points		2.75 m				Note: The mats underneath the rings were 18 cm in 1979. They were increased to 20 cm in 1989.

RINGS.

YEAR	SOURCE	HEIGHT OF PORTICO	HEIGHT FROM FLOOR	INTERIOR DIAMETER	THICKNESS	DISTANCE B/T RINGS	OTHER
2006	Apparatus Norms	5.50 m Width: 2.60 m on floor + 2.80 m at 3.20 m above the ground	2.80 m	18 cm	28 mm	50 cm	Rings made of wood or synthetic material. The straps are made of leather or sturdy material. Distance of tension cables remains the same as 1960.

Das neue Ringegerüst

(nach Richard Reuther)

Das Ringegerüst ist ein transportables Gerät, das verspannt aufgestellt wird. Aus diesem Grunde soll es möglichst leicht konstruiert sein. Bei den bisher üblichen Ringegerüsten zeigen sich, wenn dieser Forderung Rechnung getragen wird, folgende Nachteile:

1. Die beiden senkrechten Säulen (b_2) sind mit der oberen Querverbindung (c_1) starr verbunden. Bei Belastung treten immer infolge ihrer großen Länge Schwingungen auf. Diese Schwingungen sind in vertikaler Richtung zwar erwünscht, sie übertragen sich aber auch auf die Säulen (b_2), so daß das ganze Ringegerüst auch mehr oder weniger starken Schwingungen in der Horizontalen unterliegt, die nicht erwünscht sind, weil sie den Übungsablauf in seinem Schwungrhythmus stören.

   Dieser Nachteil läßt sich weder dadurch beheben, daß man das Rohrmaterial verstärkt, weil damit eine erhebliche Gewichtserhöhung verbunden wäre, noch dadurch, daß man die Säulen (b_2) näher zusammenrückt, da deren Abstand nicht unter das vorgeschriebene Maß von 2.80 bis 3.00 m verringert werden darf.

2. Um die unerwünschten Schwingungen einigermaßen abzufangen, hat man bei den bisher üblichen Ringgerüsten eine möglichst weite Verspannung gewählt. Das hat aber zur Folge, daß die normale Verankerung des Spannrecks nicht benutzt werden kann und darum eine zweite Verankerung für das Ringgerüst erforderlich ist.

Das neue Ringegerüst besteht in der üblichen Weise aus zwei parallelen Säulen mit einer Querverbindung an den Säulenköpfen für die Ringeaufhängung. Es ist aber so gestaltet, daß die geschilderten Nachteile nicht auftreten.

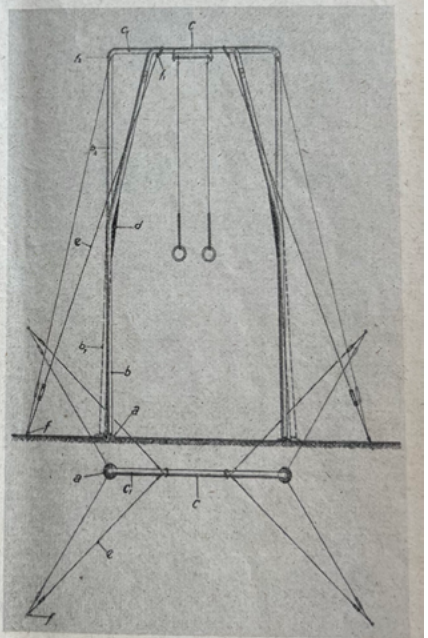
Die Säulen sind etwa in der Mitte der Säulenlänge geknickt und einander zugeneigt. Dadurch ist der erforderliche Abstand der Säulen voneinander, dort, wo er benötigt wird, nämlich in der unteren Hälfte, gewährleistet, aber dort, wo er überflüssig ist, nämlich in der oberen Hälfte, erheblich verringert, so daß die Querverbindung an den Säulenköpfen etwa um die Hälfte verkürzt ist. Das bedeutet Materialersparnis, geringeres Gewicht und leichtere Handhabung.

Die Querverbindung (c) neigt infolge der Verkürzung bei Belastung weniger zu Schwingungen. Sie federt in ihrer Gesamtlänge vertikal. Darin wird sie durch die nach innen geneigten Säulenrohre unterstützt. In diesen bleiben die senkrechten Federkräfte infolge der Abknickung vertikal. Durch die im Neigungswinkel angebrachte Verstärkung (d) werden sie geführt und können sich nicht in Vibrationen oder horizontalen Schwingungen auswirken.

Das neue Ringgerüst besitzt einen weiteren Vorzug darin, daß die Gesamtkonstruktion auf Vorspannung gebracht werden kann. Die Säulenrohre sind so konstruiert, daß die unteren Säulenhälften nicht einander parallel, sondern von der Senkrechten nach außen abweichen (b_1). Bei der Aufstellung des Gerüstes werden sie aber in parallele Stellung (b) gebracht. Auf diese Weise erhält das gesamte Gerüst eine Vorspannung. Sie kann dadurch vergrößert werden, daß die Säulenrohre über die Stellung b hinaus nach innen gerückt werden. Eine weitere Verstärkung erfährt die Vorspannung durch die Verspannung (e).

Da der Grad der Vorspannung in Abhängigkeit von der Stellung der unteren Säulenhälften verschieden gewählt werden kann, wurden die Säulenrohre mit einem beweglichen Fußteller (a) versehen. Der Teller ruht in jeder Stellung der Säulen mit seiner vollen Fläche auf dem Boden, kann sich also nicht wie ein starr befestigter Teller verkanten. Die Beweglichkeit des Fußtellers wirkt sich auch beim Aufstellen des Gerüstes auf unebenem Boden vorteilhaft aus.

Zufolge der Kürze der Querverbindung (c) rücken die Angriffspunkte der Verspannung (f_1) nahe an die Aufhängepunkte der Ringe (Angriffspunkte der Last), so daß größere Schwingungsmöglichkeiten ausgeschaltet sind.



Außerdem verringert sich der Neigungswinkel der Verspannung ($f—f_1$) im Vergleich mit der Verspannung ($f—f_2$) bei den bisherigen Ringegerüsten. Da die Verspannung günstigeren Neigungswinkel aufweist, besteht die Möglichkeit, die für ein Spannreck vorhandenen Verankerungen auch für die Verspannung des Ringgerüsts zu verwenden.

Das neue Ringegerüst zeichnet sich durch große Stabilität und geringen Materialverbrauch und außerdem durch den Vorteil der Vorspannung aus. Die Schwingungen sind im wesentlichen auf die vertikale Richtung als erwünscht beschränkt. Sie werden durch die weitere Verspannung verstärkt und unterstützen so den Schwungrhythmus des Übenden. —v

Fortsetzung von Seite 70.

lebens, in der Welt mehr geachtet als in seinem Vaterlande, das ihm heute noch sein Denkmal schuldet, ihm, den Friedrich Nietzsche, auch ein „guter Europäer" wie der vor 100 Jahren am 17. Februar in Paris verstorbene Dichter, „das letzte Weltereignis der Deutschen" genannt hat und den er liebte für seine „süße, leidenschaftliche Musik und seine göttliche Bosheit."

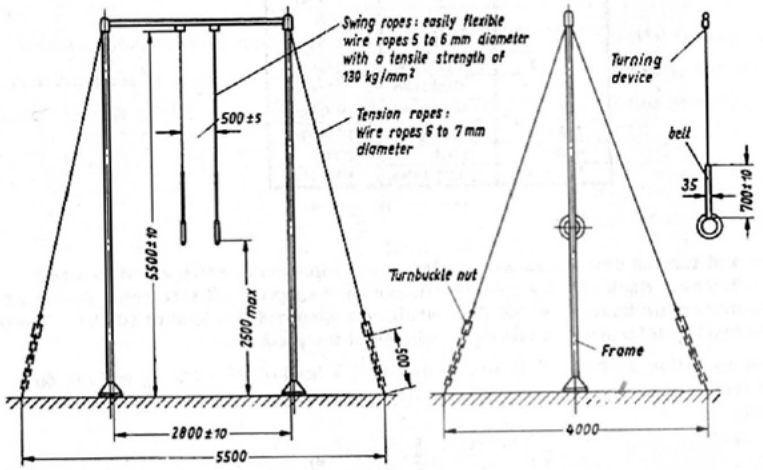
Dr. Josef Göhler

An article on a new type of ring portico, in Deutsches Turnen, Feb. 25, 1956

Part C: Rings

Shapes and dimensions not specified are left to the discretion of the manufacturer.

Dimensions in mm



Material for swing rope and tension rope: Steel
for belt: Leather or other materials having equivalent properties

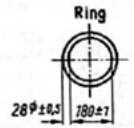
A leather belt 700 mm long, 35 mm wide and 4 mm thick for the simple belt with sewed ends shall be provided between swing rope and ring.

Each swing rope shall be fitted with stageless vertical adjustment near the turning device.

The swing ropes shall be movably supported in the direction of movement at their points of suspension.

A turning device (weighing not more than 600 g) shall be provided between the suspension equipment and the swing ropes in order to permit turning of the ropes about their longitudinal axis.

The swing ropes must not kink when not loaded.



Material: Hardwood
Execution: raw

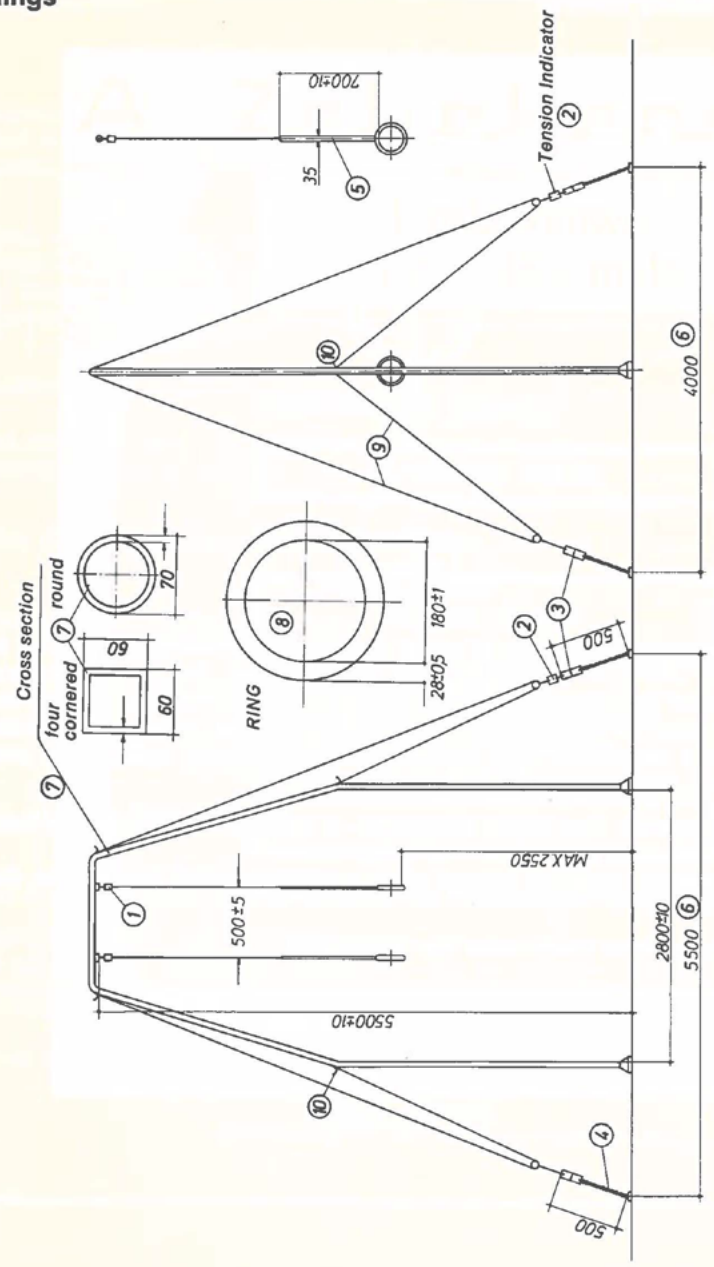
The following table is valid for the indication of dimensions in inch

1961, Apparatus Norms, printed in the AAU Gymnastics Guide, 1962-1963

1. The mechanism which makes the revolving of the ropes possible, must be either directly under the hanging point or better yet above, and its weight must not exceed 600 g (1).
2. The ring framework at the upper point must be of a conical inward shape.
3. The tension locks (3) must be of light material but able to withstand the strains demanded. The tension locks must be on each cable (2).
4. The chains (4) must be of lightweight material, but able to withstand the strains demanded, and cannot be longer than 500 mm including tension locks to avoid vibration as much as possible (1 a).
5. Between the suspension (wires and rings) a sewn leather strap must be inserted (5).
   The suspension cables must have a height regulator, without set intervals of distance, near the revolving pivot.
   Cables must hang straight without load.

Materials:

Pipe (7):	Round, 70 mm in diameter, four edge 60×60 mm, steel
Tension cables (9):	Steel, 6–7 mm in diameter
Chains (4):	Steel, zinc
Tension Locks (3):	Zinc
Tension Indicator (2)	Steel, zinc, outlay of 275 kg
Ropes (cables):	Steel, 5–6 mm in diameter, plastic covered, pull 130 kg/mm²
Rings (8):	Natural layerwood, not lacquered
Straps (5):	Leather or equiv. material, sewn together at ends, 700 mm long, 35 mm wide, 4 mm thickness for plain strap
Addtl.:	Other parts, colored lacquer
Tension (6):	4000×5500 mm (see sketch)



1974, Apparatus Norms

VAULT.

YEAR	SOURCE	TYPE OF HORSE	HEIGHT FROM FLOOR	LENGTH OF HORSE	HEIGHT OF HORSE	ZONES	TYPE OF BOARD	DIMENSIONS OF BOARD (LxWxH)
1907	Sokol, 1907, Nr. 4	Long Horse	`1.20 m	2 m			Hard Board	90 x 50 x 10 cm
1924	OLY Rulebook	Long Horse	1.20 m	1.90 m	0.40 m	Gymnasts had to place their hands on the neck.	Hard Board	60 x ? x 13 cm
		Side Horse	1.30 m					
1928	OLY Rulebook	Side Horse with Pommels	1.30 m (to the top of the pommels)				Hard Board	? x ? x 10 cm Board is 1 m from horse
		Long Horse	1.80 m	1.80 m			Elastic Boards	See images
1932	OLY Rulebook	Long Horse	1.30 m	1.80 m			Hard Board	Height: 10 cm Length: Optional
			1.80 m				Spring Board	Not Specified

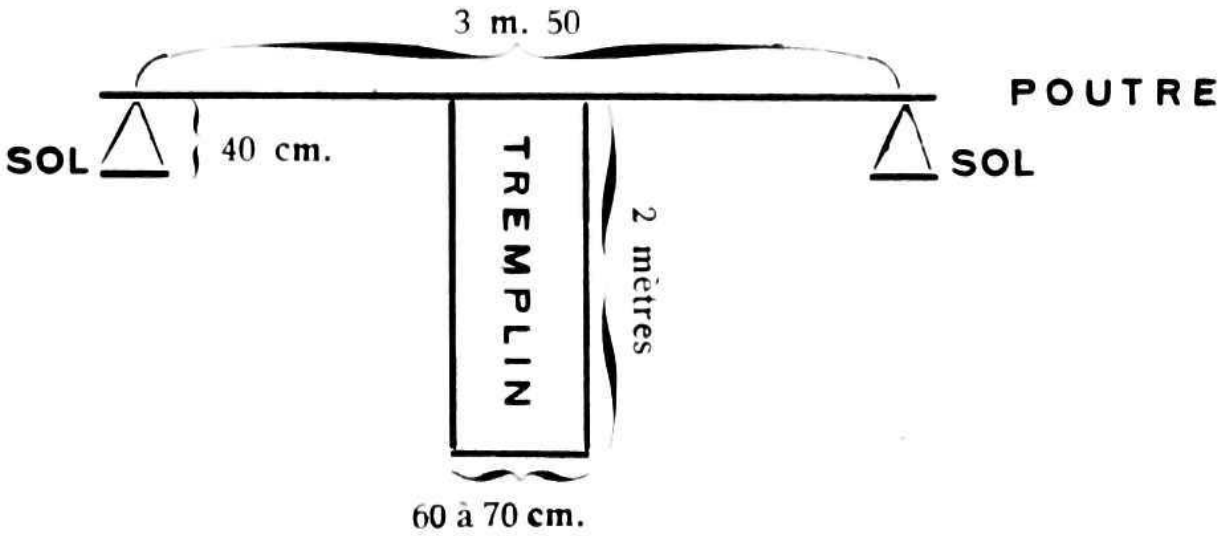
VAULT.

YEAR	SOURCE	TYPE OF HORSE	HEIGHT FROM FLOOR	LENGTH OF HORSE	HEIGHT OF HORSE	ZONES	TYPE OF BOARD	DIMENSIONS OF BOARD (LxWxH)
1936	OLY Rulebook	Long Horse	1.30 m	1.80 m		9 zones 30-15-15-15-30-15-15-15-30	Hard Board	? x ? x 10 cm
1952	OLY Rulebook	Long Horse	IDEM	IDEM		7 zones 40-15-15-40-15-15-40	Hard Board	100 x 60 x 10 cm The board must be constructed in such a way that it has little elasticity.
1960	OLY Rulebook	Long Horse	1.35 m	1.60 m			Hard Board	120 x 60 x 12 cm It can have the maximum springiness possible.
1961	Apparatus Norms	Long Horse Must be fastened to floor	IDEM	IDEM	34 cm	5 zones 40-20-40-20-40		
1971	Code of Points	Long Horse				3 zones 60-40-60		

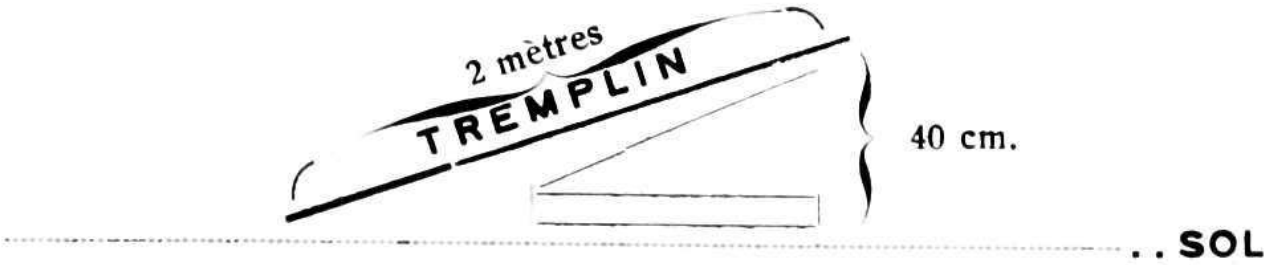
VAULT.

YEAR	SOURCE	TYPE OF HORSE	HEIGHT FROM FLOOR	LENGTH OF HORSE	HEIGHT OF HORSE	ZONES	TYPE OF BOARD	DIMENSIONS OF BOARD (LxWxH)
1974	Apparatus Norms	Long Horse	1.35 m	1.60 m	28-34 cm	2 zones 80 - 80	Double Flex Springboard	120 x 60 x 10 cm
1979	Code of Points	Long Horse				No Zones		
2001	Vault Table Introduced							

Tremplin à poutre :



Tremplin à ressorts :



For the long horse vault in 1928, gymnasts had a choice between two types of elastic boards. From: The 1928 Olympic Rulebook. For more on the different types of boards, head to this post.

Elastisches Sprungbrett

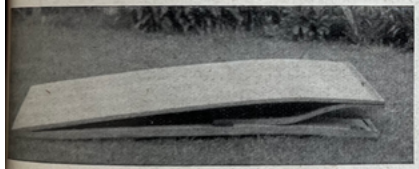
„System Reuther" neues Modell

Der neuzeitlichen Entwicklung der Leibesübungen folgt zwangsläufig eine entsprechende Entwicklung der Turngeräte. Der schwungvolle Turnstil verlangt elastische Turngeräte, die den ungehemmten natürlichen Bewegungsablauf nicht stören, sondern fördern und unterstützen.

Der rhythmisch-organische Bewegungsablauf ist der Ausfluß eines harmonischen Zusammenspiels der dem menschlichen Körper innewohnenden Spannkräfte. Ein Turngerät fördert diesen Bewegungsablauf, wenn sich das Kräftezusammenspiel wesensgleich in seiner Gesamtkonstruktion fortsetzen kann. Deshalb forderte die Geräte-Normierungskommission des Internationalen Turner-Bundes in einem Bericht: „Die Maße und Formen der Turngeräte sind einzubeziehen in die Forderung, daß das Turngerät eine gewisse Vorspannung besitzen muß, die der Reaktionsfähigkeit des menschlichen Körpers entsprechen soll, um alle Bewegungen des Turnenden weitgehend zu unterstützen, um schwungfördernd zu sein."

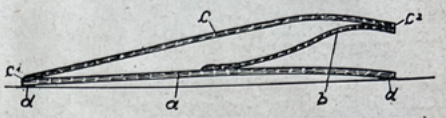
Ein Turngerät, das diese grundsätzliche Forderung verwirklicht, muß also — wie ich in früheren Veröffentlichungen über neuzeitlichen Turngerätebau bereits ausführlich darstellte — bei Beanspruchung konstruktionsbedingt vom Angriffspunkt aus bis zur Bodenauflage gleichmäßig und pyramidenförmig aufgebaute Gegenkräfte entwickeln, die dem Maß der Einwirkung durch den Übenden gleich sind, es muß Vorspannung besitzen.

Am augenfälligsten und eindringlichsten verlangt die Erfüllung dieser Forderung nach Elastizität das Sprungbrett. Wirkt doch beim Sprung über das 130 cm hohe Längspferd bei entsprechendem Anlauf durchschnittlich das siebenfache Körpergewicht des Springers im Augenblick des Absprungs auf das Brett ein. Die Nachteile eines harten Brettes für Bänder, Sehnen, Gelenke und das ganze Knochengerüst des Springenden und für die Leistung selbst bedürfen angesichts



dieser Erfahrungstatsache keiner besonderen Erläuterung. Sie sind offensichtlich. Es ist noch nicht allzu lange her, und die älteren Turner erinnern sich noch gut der bandagierten Fuß- und Kniegelenke vieler Wettkämpfer beim Pferdspringen als der sichtbaren Zeichen dieser Nachteile des harten Sprungbrettes.

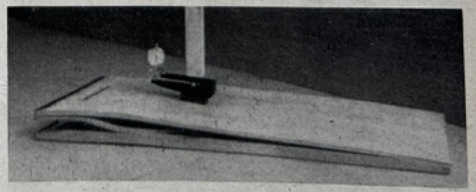
Ich selbst litt stark an beim Pferdspringen zugezogenen Kniegelenkschäden, die mir diese Übungsart sehr verleideten. Deshalb war ich schon im Jahr 1940 bemüht, ein elastisches Brett zu konstruieren. Diese Bemühungen waren allerdings eingeschränkt durch die damaligen Normen und Maße. Trotzdem gelang mir in der Konstruktion des „elastischen Reutherbretts" eine Form zu finden, die dem harten Wettkampfbrett gegenüber wenigstens die gröbsten körperschädigenden Belastungen vermied. Dieses Brett hat vor allem nach dem Kriege allgemein Anklang und Verwendung bei Deutschen Meisterschaften und Länderkämpfen gefunden. Es bedeutete einen Fortschritt im Zuge der neuzeitlichen Geräteentwicklung. Angesichts der Entwicklung des Turnstils und der starken Revolution des Kunstturnens in den letzten Jahren hat das Technische Komitee des Internationalen Turner-Bundes, einem Vorschlag der Geräte-Normierungskommission folgend, die bisher gültig geltenden Maße und Normen überprüft und so abgeändert, daß die Turngeräte weitgehend dieser Entwicklung angepaßt werden können. So erlauben die neuen Richtlinien nun für das Wettkampfbrett innerhalb bestimmter Maße (Länge 120 cm, Breite 60 cm, Höhe 12 cm) größtmöglichste Elastizität. Damit war Gelegenheit gegeben, den Gedanken der Vorspannung auch in der Konstruktion des Sprungbretts zu verwirklichen, d. h. die Gesamtkonstruktion in den Federungsprozeß einzubeziehen. Meine jahrelangen Erfahrungen und Erkenntnisse aus Versuchen fanden ihren Niederschlag in einem Sprungbrett, das auf Grund seiner konstruktionsbedingten Vorspannung im Rahmen der gegebenen Maße größtmöglichste und vor allem gleichmäßig wirkende Federkraft mit großer Bruch- und Rutschsicherheit vereint, wobei die ebenfalls elastische Übertrittsfläche und die Elastizität des Brettes auch



an seinen hohen Kanten unfallverhütend wirken. Die zweckmäßig feste Verbindung aller Einzelteile und damit die Einbeziehung der Gesamtkonstruktion in die Federung verhindert, daß Zug- oder Druckspannungen ins Leere gehen. Die Federkraft ist wesentlich wirkungsvoller. Dadurch wird die Lust und Freude am Springen in allen Altersstufen, besonders aber bei unserer Jugend, geweckt. Die Leistungen werden besser, schöner, wirkungsvoller. Die Möglichkeit der maschinellen Herstellung der Einzelteile wirkt sich preisgünstig aus.

Das neue Sprungbrett besteht in allen seinen Teilen aus Holz als organischem, den menschlichen Körper am besten ansprechenden Werkstoff. Die Einzelteile sind in einem Spezialverleimungs- und -preßverfahren hergestellt. Dabei bildet die Zahl der Fournierschichten bereits ein wesentliches Moment im Zusammenspiel der Federkräfte.

Abb. 1 veranschaulicht das Brett in seiner neuen Form. Abb. 2 zeigt einen Längsschnitt durch das Brett. Die die Gesamtkonstruktion tragenden Holmen (a) sind entsprechend ihrer Aufgabe geformt und am kräftigsten gehalten. Sie sind an den Enden mit einem Gummibelag (d) versehen, der nicht nur die Rutschsicherheit gewährleistet, sondern auch durch Aufnahme der sich in den Holmen nach beiden Seiten auswirkenden Druckspannungen in den Federungsprozeß mit eingeschaltet ist. Die beiden Holmen sind durch das s-förmige Federblatt (b) fest miteinander verbunden. Von dieser Feder wird das Deckblatt (c), das Absprung- und Übertrittsfläche in einem Stück vereint, getragen. Das Deckblatt ist an seinem oberen Ende (c_2) mit der Feder und an seinem unteren Ende (c_1) mit den Holmen fest verbunden. Aus Form, Stärke, Anordnung und Zusammenbau der Einzelteile ergibt sich die der Gesamtkonstruktion eigene Vorspannung. Die durch sie gewährleistete gleichmäßig wirkende Federkraft wird in Abb. 3 geprüft. Bei einer praktisch wahrscheinlichen Höchstbelastung von 500 kg setzen sich Deckblatt, Feder und Holmen aufeinander bzw. auf dem Boden auf. Das Brett ist deshalb bruchsicher, und die Vorspannung wirkt nach seiner Entlastung bleibenden Formveränderungen entgegen.



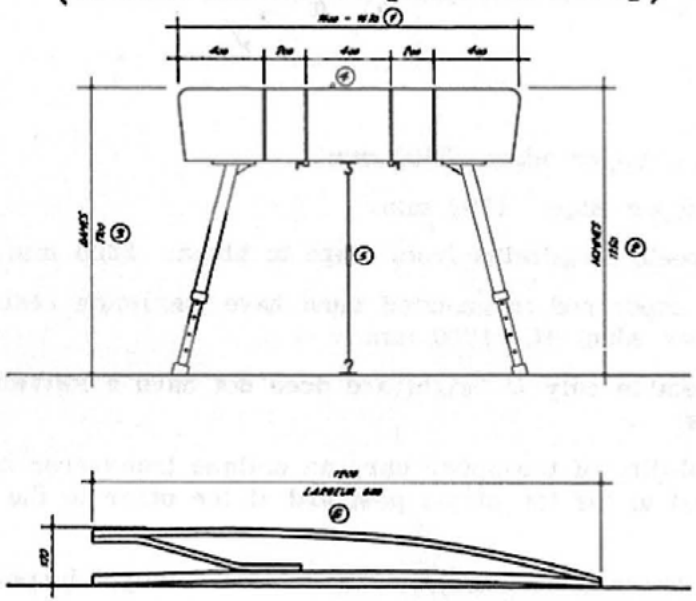
Das neue Modell des „elastischen Reutherbretts" ist nicht nur in Versuchen, sondern auch in jahrelanger Vereinsarbeit, durch den Eidgen. Turnverband der Schweiz, an den Sporthochschulen Köln und München-Grünwald und bei den Europameisterschaften im Kunstturnen 1955 eingehend erprobt. Seine bisherige Bewährung hat die Mitglieder der technischen Kommission des ITB veranlaßt, dieses Brett auch für die Wettkämpfe bei den Olympischen Spielen in Melbourne zu verwenden.

Richard Reuther

Richard Reuther discusses the new Reuther boards, *Deutsches Turnen*, n. 22, 1956

VAULTING HORSE (MEN AND WOMEN)

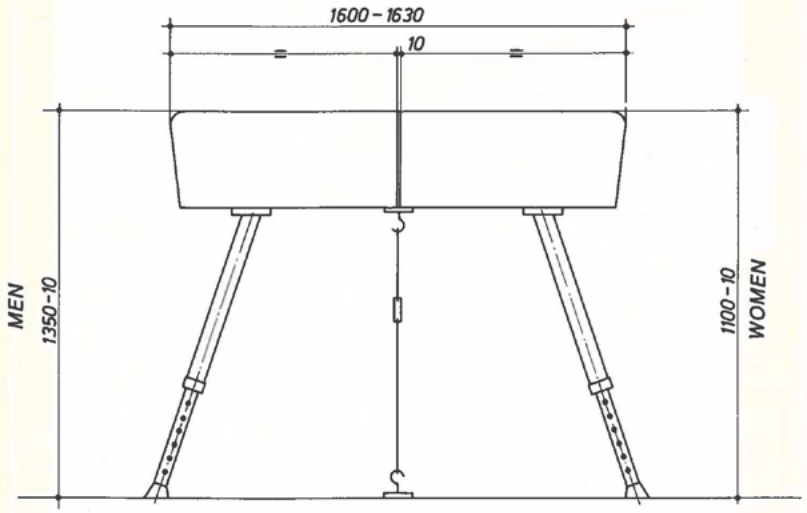
(CHEVAL POUR LE SAUT [HOMMES ET DAMES])



1. Length of the body of the horse: 1600-1630 mm.
2. Height from floor for men: 1350 mm.
3. Height from floor for women: 1100 mm.
4. Grip zones for men: 400 mm in front and back, then 200 mm in front and back and 400 mm in middle. Grip zones are marked by a white line 10 mm wide.
5. The horse should be fixed to the floor.
6. The beat board should have the following measurements: length 1200 mm, height 120 mm, width 600 mm. Within these measurements it can have great elasticity. It is important that this elasticity is provided evenly at the highest point (see Reuther system). For women, the beat board should be covered with a layer of rubber. The beat board should be placed at increments of 50 mm by means of a frame connected to the horse.

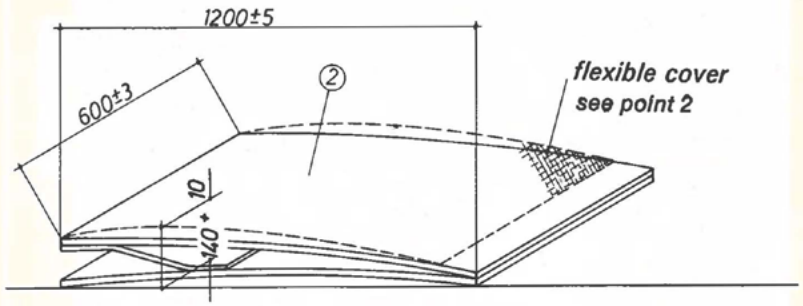
1961, Apparatus Norms, printed in the AAU Gymnastics Guide, 1962-1963

Vaulting horse



Style:	Variations 1, 2, or 3 of the pommel horse.
Material:	As described.
Measurements:	According to sketch. Height adjustment: from 1100–1350 mm in intervals of 50 mm. Grip zone for vaulting horse: in center, marked out by white lines 10 mm wide.
Anchors:	Absolutely necessary.
Pommel Horse used for vaulting:	In this case, it is a must to ensure a smooth surface after pommels have been removed (possibility of danger). For minor competition or training, a cover may be used. See sketch, last page of booklet.

Double flex springboard
for men and women



1. The springboard must offer great flexibility (elasticity). This flexibility must be most effective on the highest point.
2. The upper surface of the board must be covered with a non-slip artificial layer and must be equipped with a 6 mm strong elastic material and collectively 10 mm strong.
3. The springboard must be attachable to the horse, and must be adjustable in intervals of 50 mm.
4. The use of the double flex springboard is authorized for use with various pieces of apparatus, according to rules in the Code of points.
5. The material used is wood. The shape of the board is the manufacturer's choice, bearing in mind however the requirements for testing the equipment.
6. The measurements given in the above sketch must be strictly adhered to.
7. Testing the flexibility (elasticity) of the apparatus:
   a. A weight of 600 kg placed 300 mm from the edge of the highest point on the upper surface must force the board downwards up to 85 mm, with a tolerance of ±5 mm or less.
   b. When the weight is removed, the board must resume its original shape.
8. The surface must be covered with a non-slip rippled rubber material or similar glide protection.

1974, Apparatus Norms

FIG APPARATUS NORMS

1.) SPRINGBOARD

2.) Use

In Artistic Gymnastics, for vaulting, and for mounts on Parallel Bars, Uneven Bars and Beam.

3.) Form

The profile of the springboard must adhere exactly to the respective blue print.

Its upper surface rises in an arched form, approaching the horizontal between 75 cm and 95 cm, measured from the frontal angle.

The height reached at this point, may not be exceeded. After this point, the upper surface may continue horizontally or slope downward.

The rise of the arch is 3 cm to 4 cm.

It must be observed, see blue print of profile, that the arch rises to 16 cm, up to the 95 cm farthest point shown in the horizontal projection.

The remaining 4 cm are for the base.

The stipulated length and height refers to the horizontal projection of the upper plate, i.e. the take-off plate.

The base may be larger, but cannot extend more than 2 cm beyond the projection of the board.

This form, based on given length, width, height and profile, must be strictly adhered to.

Deviations are permitted only within the parameter of the given tolerances.

SPRINGBOARD

4.) Measurements

- Length	120 cm * 1 cm
- Width	60 cm * 1 cm
- Height	20 cm * 1 cm
- Cushion Cover	2 cm * 0.5 cm
- Total height with cushion cover	22 cm * 1.5 cm

(* Tolerance)

5.) Adjustments

Not applicable.

6.) Functional Properties

Elasticity

The springboard must have a regulated restricted elasticity, in order to keep the mechanical support given to the gymnast, within tolerable limits.

The elasticity of the springboard must be most effective in the area between 75 cm and 95 cm, measured horizontally from the frontal angle (point A).

Absorbance

The springboard must dampen the counter pressure, i.e. reduce motion energy.

Uniformity

Elasticity and absorbancy must be evenly distributed, so that the effect of the spingboard differs only slightly, regardless whetherthe force of the impact is at the middle axis, or away from it.

Slip Resistance

The upper surface of the springboard must offer slip resistance.

Apparatus Norms, 1989 - Thanks to Hardy Fink for the photos.

SPRINGBOARD

Stability

The board must not dislodge during use.

Noise Dampening

The board must not produce disturbing sounds during its use.

.) Indicators of the functional properties

The use of specific test procedures resulted in the following measurements, which characterize the mandatory properties:

Elasticity and Absorbance

	SEIN	SRUCK	FOMAX
Minimum	70 mm	285 mm	
Maximum	80 mm	405 mm	4550 N
Maximum difference for excentric measuring points	4 mm	25 mm	150 N
Maximum difference for axile measuring points	15 mm	120 mm	

Additional Indicators

Measurements and Test procedures for the following properties must still be defined:

Slip Resistance of the upper surface
Noise level during take-off

8.) Materials and Construction

They are left to the discretion of the manufacturer, but must strictly adhere to the given norms.

SPRINGBOARD

9.) Technical Safety Rules

The springboard and its base may not have any sharp corners, edges and no protruding parts.

10.) Color

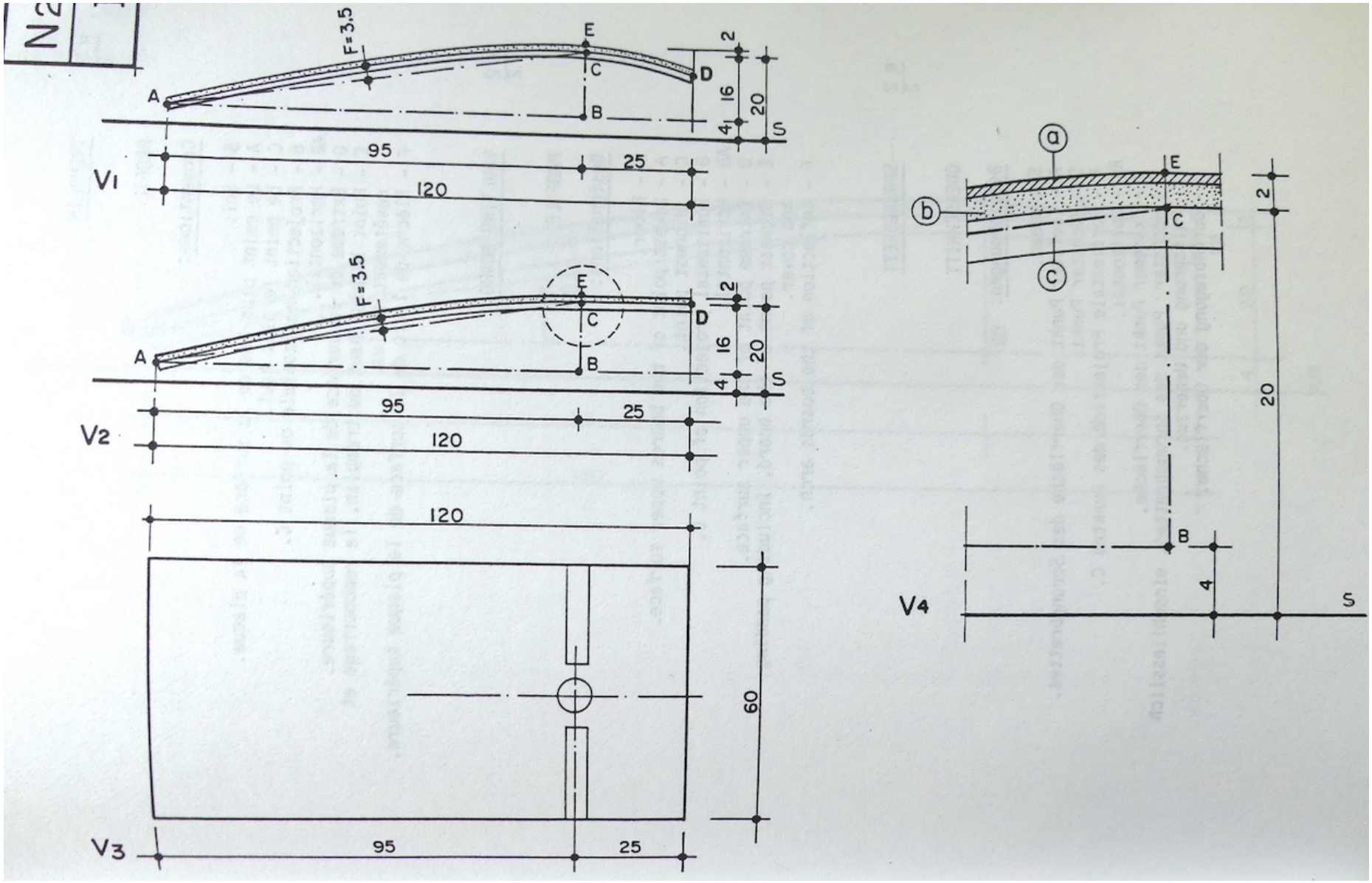
Optically disturbing patterns, stripes or insignias on the upper surface are not permitted.

A mark will indicate the point were the rebound is most effective.

The selection of color is left to the discretion of the manufacturer.

The E.C. may designate the color for certain events.

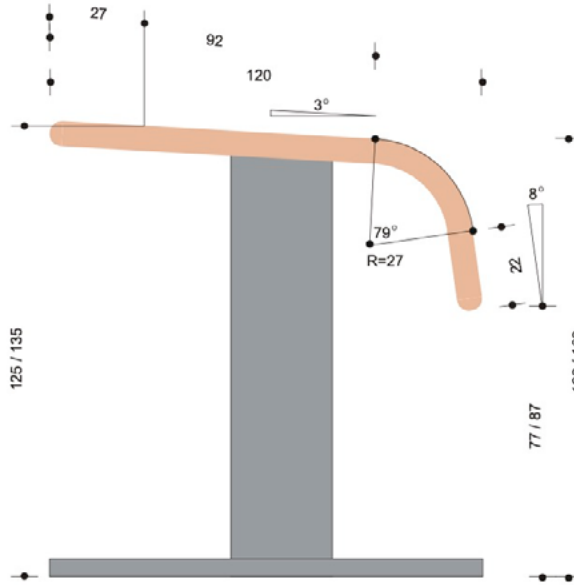
Apparatus Norms, 1989



Apparatus Norms, 1989

If you grew up in the United States around this time, you probably thought that springboards with coiled springs were the norm everywhere. They weren't. The Apparatus Norms were vague, which is why the 1991 World Championships used a springboard, while the 1992 Olympic Games used a Reuther-style board.

Seitenansicht:



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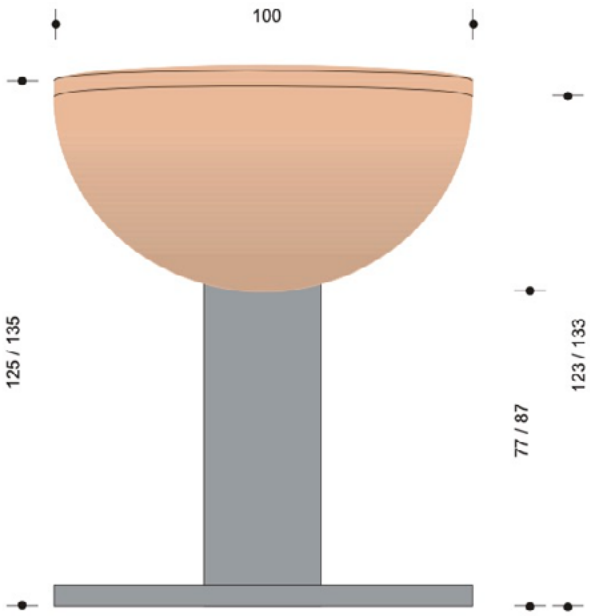

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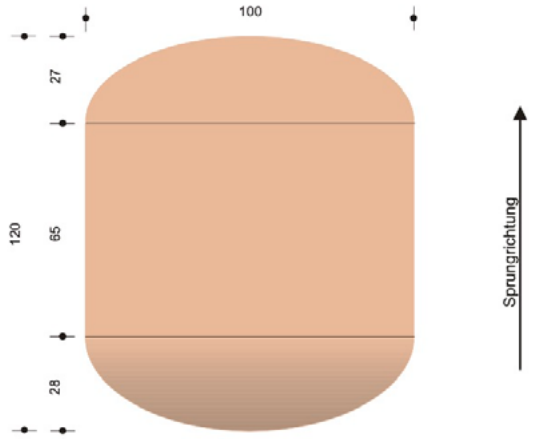


Bemerkung: Unterkonstruktion schematisiert.

Draft of the Vault Table from Janssen Fritsen in 2000. Janssen Fritsen was the equipment manufacturer for the 2001 World Championships in Ghent, Belgium.

Note: Many of the dimensions are the same today. There's still an 8º angle at the front of the table, and the table is still 120 cm long. But there are differences. Today's vault, for example, is slightly narrower (95 cm today vs 100 cm in 2001), and the back of the vault is no longer as curved as it was in 2001.

PARALLEL BARS.

YEAR	SOURCE	HEIGHT	LENGTH OF RAILS	WIDTH B/T RAILS	BAR DIAMETER	Other
1907	Sokol, 1907, Number 4	1.60 m	3.0 m	42-43 cm		
1909	Sokol, 1909, Number 3	IDEM		42-45 cm		
1912	OLY Rulebook	IDEM	3.0 m	IDEM	45-48 mm	
1924	OLY Rulebook	1.50 m	2.80 m	42 cm	50 x 48 mm	
1928	OLY Rulebook	1.65 m	3 m	IDEM	54 x 46 mm	Oval-Shaped Bars
1932	OLY Rulebook	1.60 m	IDEM	IDEM		
1936	OLY Rulebook	IDEM	3.0 to 3.40 m	42-46 cm		Oval-Shaped Bars

PARALLEL BARS.

YEAR	SOURCE	HEIGHT	LENGTH OF RAILS	WIDTH B/T RAILS	BAR DIAMETER	Other
1948	OLY Rulebook	1.60 m	3.0 to 3.50 m	42-46 cm		Oval-Shaped Bars
1952	OLY Rulebook	IDEM	3.50 m	42-48 cm		Oval-Shaped Bars Very tall gymnasts may request a height of 1.70 m.
1960	OLY Rulebook	1.70 m	IDEM	IDEM	51 (vertical) x 41 (horizontal) mm	Distance between uprights: 2.30 m Height of crosspieces, in wood or iron, 10 cm The apparatus does not have a bottom floor between the uprights. If the apparatus is not heavy enough to guarantee its stability, it must be fitted with a device that fixes it to the ground. Bars made with wood or wood with reinforced lining, e.g. steel, to prevent breakage.

PARALLEL BARS.

YEAR	SOURCE	HEIGHT	LENGTH OF RAILS	WIDTH B/T RAILS	BAR DIAMETER	Other
1965	Apparatus Norms	1.70 m	3.50 m	42-52 cm	51 (vertical) x 41 (horizontal) mm	
1974	Apparatus Norms	1.75 m	IDEM	IDEM	IDEM	Wood or manifold glueed, reinforced to avoid total breakage.
1979	Apparatus Norms ISO-378-1980	1.75 m May be raised to 1.80 m	IDEM	IDEM	IDEM	The bars shall be of wood, laminated (or at least have a surface of wood) with reinforcing core (in order to prevent total breakage) or any other hygroscopic material with the same functional characteristics as wood (impact strength, sweat absorbent, magnesia-neutral).
1987	Apparatus Norms	1.85 m from floor with a 12 cm mat				
1989	Code of Points	1.95 m				

PARALLEL BARS.

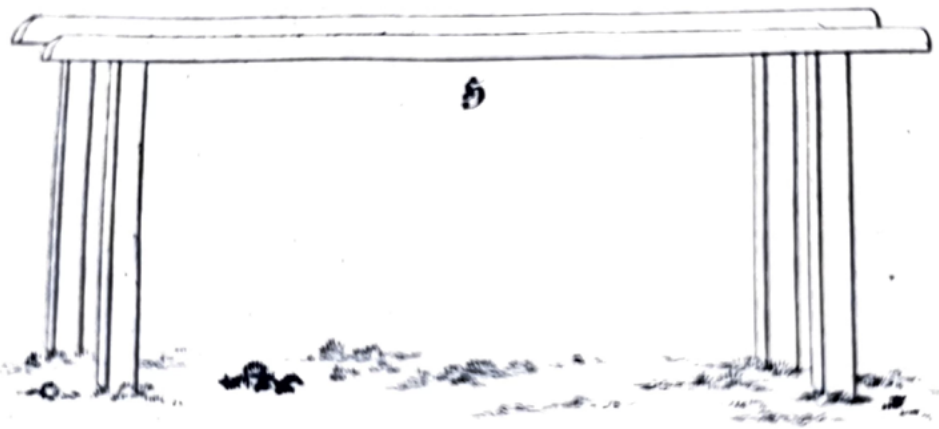
YEAR	SOURCE	HEIGHT	LENGTH OF RAILS	WIDTH B/T RAILS	BAR DIAMETER	Other
2006	Apparatus Norms	2.00 m	3.50 m	42-52 cm	50 x 40 mm	The upper surface of the bars must be made of wood.

Barren.

9 Barren, jeder 10 F. lang: macht an Überlagen
(18 × 10 F.) = 180 F. dreizollig Kreuzholz.

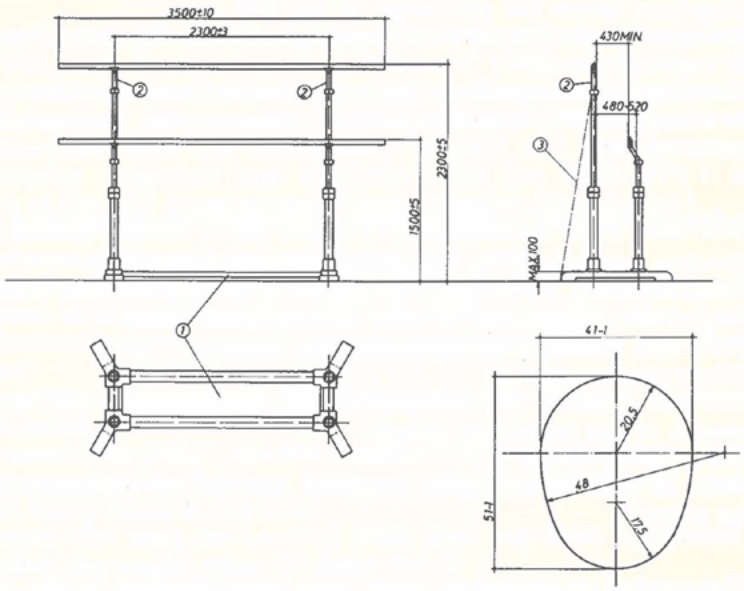
Höhe v. d. Erde. Weite. macht an Ständern:

1 von 2 F. 6 Z.	— 12 Z.	— (4 × 4) F.	= 16 F.	vierzollig Kreuzholz.
2 „ 3 F.	— 14 Z.	— (8 × 5) F.	= 40 F.	
2 „ 3 F. 6 Z.	— 16 Z.	— (8 × 5½) F.	= 44 F.	
2 „ 4 F.	— 17 Z.	— (8 × 6) F.	= 48 F.	
1 „ 4 F. 6 Z.	— 18 Z.	— (4 × 7) F.	= 28 F.	
1 „ 5 F.	— 20 Z.	— (4 × 7½) F.	= 30 F.	
			206 F.	



Dimensions for Parallel Bars in Jahn's Die Deutsche Turnkunst, 1816

The largest setting was 5 feet high (1.524 m). The rails were 10 feet long (3.048 m), and the spread between the rails was 20 inches (50.8 cm).



This measurement from pivot point to pivot point (1) has great functional importance and must be strictly adhered to.

This height 1750 mm (2) must be capable of extension to an addtl. 50 mm.

The bar (hand rail) must not have any straight edges or corners where they meet the uprights (3).

The distance (4) has great functional importance and must be strictly adhered to.

To avoid accidents, these cross bars (5) must not expose any sharp edges.

Grooved rubber padding (6) or equivilant glide protection.

. The diagonal and length connection (cross bar) cannot be connected with a ground board (8), however there must be a means to avoid danger of hitting the cross bars during a swing or in case of a fall.

This device must consist of 2 small boards form the ground to the top of the cross bar (7) or of a construction directly connected to the cross bars.
Ground boards may not be moveable.

9. If the bars are not heavy enough to withstand the weight of the gymnasts, provisions must be made to attach the apparatus to the ground, indoors as well as outdoors.

10. **Materials:**

Bars:	Wood or manifold glued, reinforced to avoid total break.
Slide stability:	Rubber or an equivalant glide protection.
Remaining parts:	Steel or cast iron.
Addtl.:	Wood bars natural, no lacquer, other parts can have lacquer in any color.
Adjustm.:	A tolerance of 50 mm, easily adjustable, may not move during use.
Width adjustm.:	Must be between 480–520 mm, guaranteed.

Apparatus Norms, 1974

HIGH BAR.

YEAR	SOURCE	HEIGHT	LENGTH	DIAMETER	MATERIAL	Other
1907	Sokol, 1907, Number 4	2.30 m	2.30 m	32 mm	Iron	
1908	OLY Rulebook					Movable horizontal bars of steel and steel covered in leather.
1912	OLY Rulebook	2.40 m	2.20 m	32 mm	Polished Steel	
1924	OLY Rulebook	2.30 m	IDEM	IDEM	Polished Steel or Wood	
1928	OLY Rulebook	Height of Swing	2.40 m	28.5 mm	Polished Steel	
1932	OLY Rulebook	IDEM	IDEM	30 mm	IDEM	
1936	OLY Rulebook	2.40 m	IDEM	28-30 mm	IDEM	

HIGH BAR.

YEAR	SOURCE	HEIGHT	LENGTH	DIAMETER	MATERIAL	Other
1952	OLY Rulebook	2.40 m		28 mm	Polished Steel	Very tall gymnasts may request a height of 2.50 m
1960	OLY Rulebook	2.50 m	2.40 m	IDEM	IDEM	The guy wires are fixed to the ground at lateral distances of 1.50 m and transversal distances of 2.00 m from the foot of the uprights. (Total lateral distance between fixed points in the floor: 5.50 m; total transveral distance between fixed points on the floor: 4.0 m)
1965	Apparatus Norms	IDEM In exceptional cases: 2.55 m	IDEM	IDEM	IDEM	
1974	Apparatus Norms	2.55 m	IDEM	IDEM	IDEM	Steel, zinc cables. The seating of the bar shall be designed in such a way that the bar may swing freely and without noise in all directions

HIGH BAR.

YEAR	SOURCE	HEIGHT	LENGTH	DIAMETER	MATERIAL	Other
1987	Apparatus Norms	2.75 m (with an 18 cm mat)	2.40 m	28 mm	Stainless Steel	
1989	Apparatus Norms	2.75 m (with a 20 cm mat)	IDEM	IDEM	IDEM	
2006	Apparatus Norms	2.80 m	IDEM	IDEM	IDEM	Distance of tension cables remains the same as 1960.

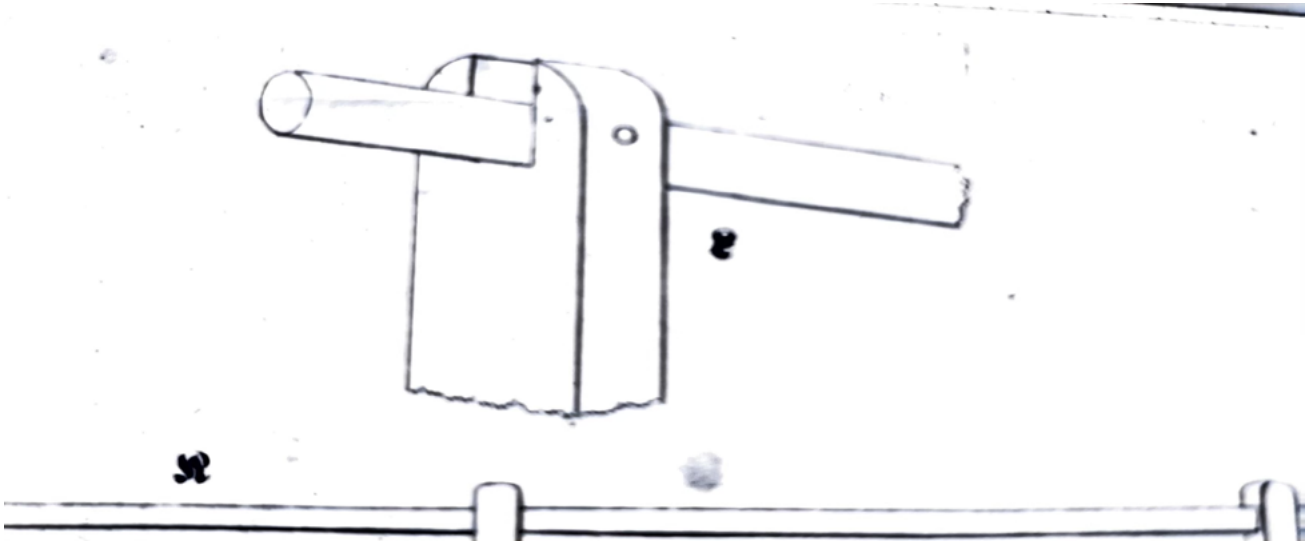
Zum Hangelreck:

6 Stangen von 9 F. Länge und 2 ½ Z. Stärke.

6 Ständer, 7 F. über-, 2 F. in der Erde: macht (6 × 9) F. = 54 F., vier- bis fünfzollig Kreuz- oder Ganzholz.

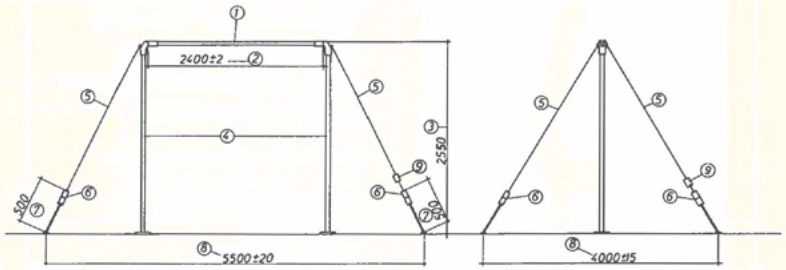
Dimensions for High Bar in Jahn's Die Deutsche Turnkunst, 1816

The bar was 7 feet high (2.1336 m) and 2 feet deep into the earth. The entire bar was bar was 9 feet long (2.7432 m). The bar was 2.5 inches thick (6.35 cm)



The type of attachment used for the high bar in Jahn's Die Deutsche Turnkunst, 1816

Horizontal bar



Materials:

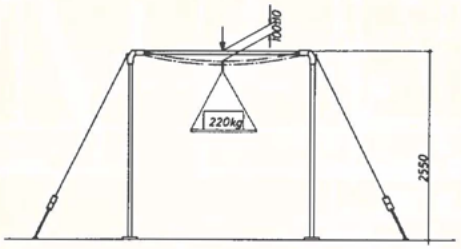
Bar:	(1) 28 mm in diameter ± 0,1 mm Steel with minimum strength of 130–140 kg/mm² Length: (2) 2400 mm ± 2 mm
Other parts:	Steel Horizontal bar, polished
Other parts: **Anchor:**	Lacquered, any color Zinc (7) maximum length 500 mm, including tension lock
Tension lock: **Tension tester:**	Zinc (6) Zinc (9)
Tension cables:	Steel cables of 6–7 mm in diameter (5)
Hooks:	Steel, for safety precaution

All measurements and tolerances must be exactly according to sketch, especially 1, 2, 3, 4, 8.
The height of the horizontal Bar is 2550 mm, with a tolerance of 50 mm.

The bar must be constructed in such a way, that it may swing noiseless in all direction.

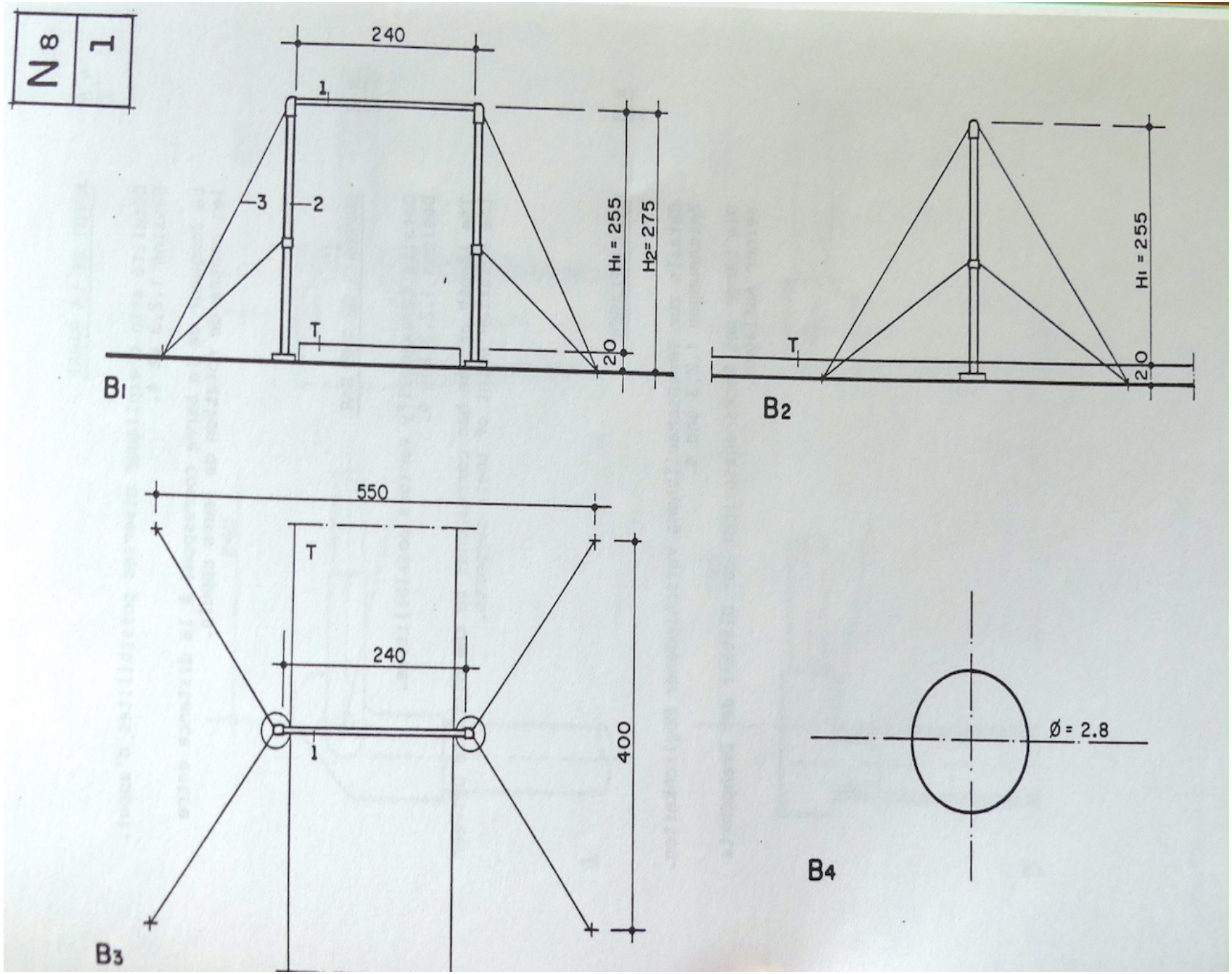
The measurements (8) because of uniform use and elasticity are of great importance and must be strictly adhered to.

Horizontal bar, safety control



1. Bar at a height of 2550 mm (upper ridge) in tension position will be loaded with a weight of 220 kg, in the center the bar must produce a sag of 100 mm with a tolerance of ±10 mm.
2. A tension tester with a red ring, must be used as prescribed.
3. When the weight is removed, the bar must resume a straight line and the apparatus as such must not show any change from its original state.
4. Each of the four (4) tension connections between the posts, cables and anchors on the floor must be tested under a weight of 600 kg by the constructor and the organizer.
   After the weight is removed, there can be no deformation of the apparatus.
5. Prior to a FIG or similar competition, or any international competition, a member of the Technical Committee or the Superior Judge must test the apparatus as prescribed in 1 and 2 as well as 8.

Apparatus Norms, 1974



Apparatus Norms, 1989, via Hardy Fink

LANDING MATS.

YEAR	SOURCE	POMMEL HORSE	RINGS	VAULT	PARALLEL BARS	HIGH BAR	NOTES
1974	Apparatus Norms	6.0 to 6.5 cm	6.0 to 6.5 cm	6.0 to 6.5 cm	6.0 to 6.5 cm	6.0 to 6.5 cm	
1979	Apparatus Norms	6.0 cm	18 cm	18 cm	12 cm	18 cm	
1989	Code of Points	10 cm	20 cm	20 cm	20 cm	20 cm	
2000	Apparatus Norms	IDEM	IDEM	IDEM	IDEM	IDEM	10 cm supplementary mats are listed, but their use is not prescribed.
2006	Apparatus Norms	IDEM	IDEM	20 cm + 10 cm supplementary mat	IDEM	20 cm + 10 cm supplementary mat	