

LOUISE LINDER

B.A. Fine Art, Advanced Diploma in Art (Cape Town).

A SERIES OF SCULPTURES BASED ON
A CREATIVE INVESTIGATION OF THE
IMAGERY AND FORMAL QUALITIES
INHERENT IN SELECTED MECHANICAL
STRUCTURES.

Documentation, and commentary on the body of practical
work submitted for the degree of Master of Fine Art
at the University of Cape Town.

November
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CREATIVE INVESTIGATION OF THE IMAGERY
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SELECTED MECHANICAL STRUCTURES

Louise Linder

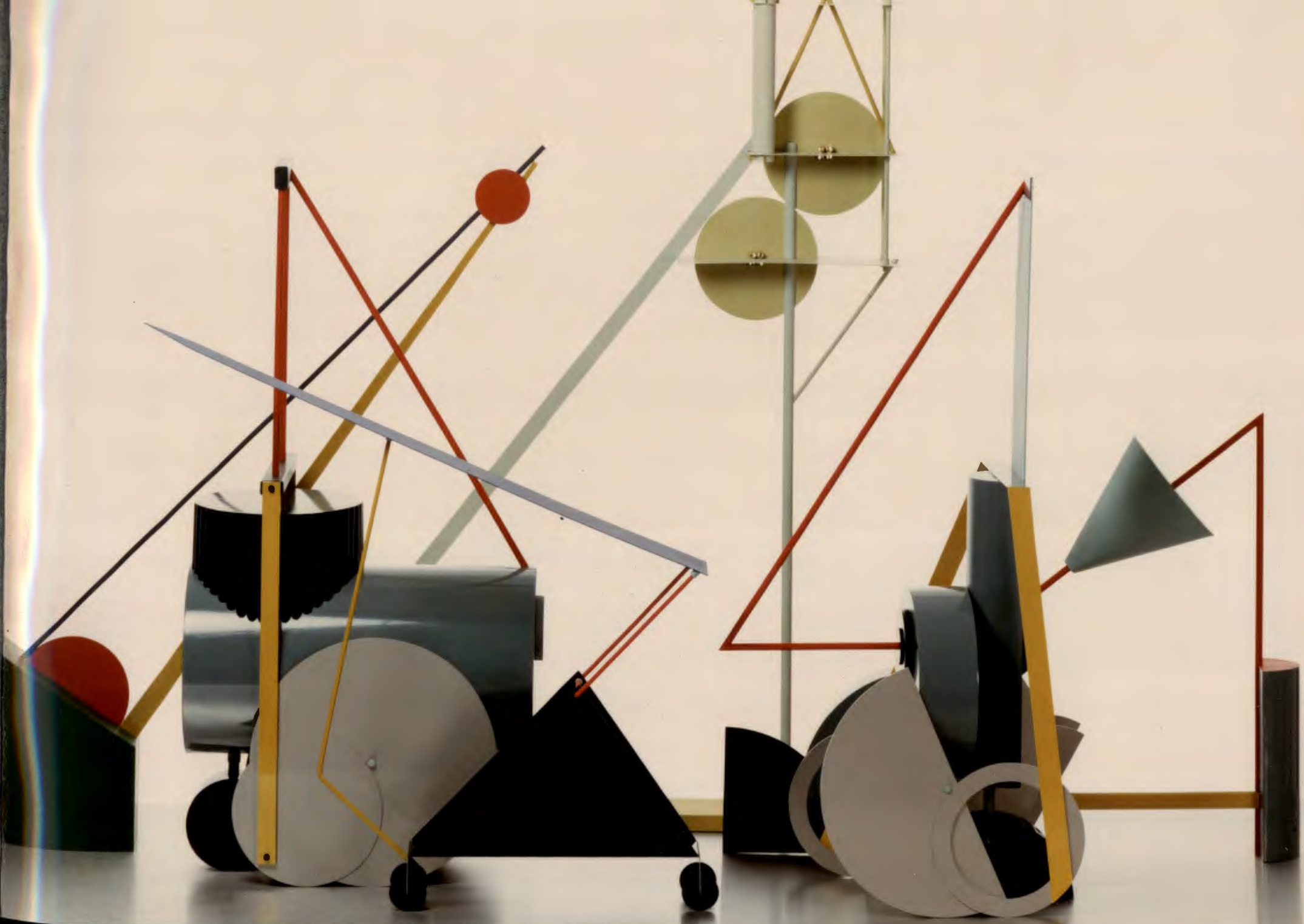


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2 PROPOSAL

In order to meet the requirements for the MFA degree at the University of Cape Town I proposed to create a body of sculptures based on studies initiated during my year of study for the Advanced Diploma in Art at the Michaelis School of Fine Art. These studies involved the observation and formal analysis of certain functional structures relating mostly to industry, and led to the making of sculptures characterised by formal reduction and abstracted 'constructivist' forms.

My intention for the MFA study was to pursue this methodology and to extend the scope to include architectonic elements relating to both interior and exterior structures and spaces, as well as other objects such as machines.

My source material was largely taken from 19th-century technical illustrations of industrial machinery for the reason that the functions of the chosen mechanical structures were overtly expressed by the constituent parts, which became the compositional elements of my sculptural abstractions.

3.1 A SELECTIVE HISTORICAL BACKGROUND TO THE DEVELOPMENT OF ABSTRACTION IN MODERN SCULPTURE

This section briefly covers the development of abstraction in its different aspects, in search of a definition of the 'new art object' which is simultaneously radically abstracted but retains a latent meaning.

In the first half of the twentieth century Western art was largely concerned with a semantic dialogue between Naturalism and Abstraction, and the exploration of different visual languages. Herbert Read saw Realism (Naturalism) as "an expression of confidence in, and sympathy for, the organic processes of life", and abstraction as the "reaction of Man confronted with the abyss of nothingness, the expression of an angst which distrusts and renounces the organic principles, and affirms the creative freedom of the human mind in such a situation."¹

In France, Analytical Cubism (1909-11), effected a break from the traditional rôle of the artwork and its language. Its concern was primarily with analysis of form and space. In painting the image was expressed in form exploded over the surface of the canvas in a shallow arrangement of angular facets interpenetrating the surrounding space. This resulted in a loss of concentrated volumetric form and illusionistic perspectival depth. Synthetic Cubism (1912-24), replaced this analysis with a synthesis of the artifact and external reality. The paradox between illusionism (as for example employed in the trompe-l'oeil nail or simulated chair-caning), and the Cubist abstracted and invented forms, expressed the existential need for a "multilevelled" language that "conforms to the twentieth century's refusal to accept a single, absolute interpretation of reality."²

In Italy, the Futurists divorced themselves further from the representation of concrete subject-matter, in that their work incorporated abstract concerns such as speed, movement through space and the dynamism of the Machine Age. Umberto Boccioni (1882-1916), in a lecture in 1911, stated : "We want to represent not the optical or an analytical impression but the physical and total experience."³ In his Development Of A Bottle In Space 1912, the subject is a conceptual problem which is concretised by iconic movement, that is to say, the sensation of the manifestation of a bottle in space is expressed as an image of dissecting, swirling lines and planes, which allow the object to penetrate surrounding space, while retaining its constant interior shape.

Constructivism in Russia had a parallel movement in the West in the form of De Stijl. What emerges from the manifestos pertaining to both these movements is a belief that the artist has intellectual sovereignty in the creation of the art object : that he reconstructs with a logical consciousness an art language derived from a self-imposed set of laws. In this way, the art object, being autonomous and non-reflective of an external visual system, develops a set of commonly-denominated principles that can only be applied to its internal system, and that, ultimately, gives it its meaning. Naum Gabo (1890-1972), a Russian constructivist, took the Futurist method of articulating abstraction even further, in that his point of departure was no longer an object or a figure, but rather the physical elements of space, line, and plane. He asserted that line and depth were the only expressive means (renouncing volume, mass, and colour), and that their rôle was not representational. Rather, they were of an autonomous nature. He elaborated on this issue in The Constructive Idea In Art, 1937, by ascribing to these elements the further rôle of content. "These two elements are from the constructive point of view one and the same thing. It does not separate the content from the form - on the contrary, it does not see as possible their separated

and independent existence." ⁴ Concurrent with his belief that the artist's rôle was to visualise the language of the scientist and concretise its abstractions in the eyes of the masses, was a belief that the images of reality were built by man himself and that these changed according to changing perceptions of life through religion, ideologies and science. This concept of changing reality is synonymous with the concept of time and movement as explored in his work.

Another approach to abstraction in the visual arts was initiated by Kasimir Malevich (1878-1935), an approach which was congruent with that of El Lissitzky (1890-1956), and Piet Mondrian (1872-1944). Malevich called for a 'non-objective' art, 'non-objective' in that it did not concern itself with objects; Mondrian referred to pure plastics; Lissitzky used the term 'Prouns', as "the interchange station between painting and architecture" ⁵ and defined architecture as "art in its highest sense, mathematical order." ⁶ Prouns (from PRO UNOVIS - "project for the establishment of a new art"), were essentially innovative syntheses incorporating the second and third dimensions, arranged into spatial compositions while retaining the basic syntactical planes, volumes, and lines, relative to both painting and architectural detail. These artists looked for universal laws in a constant reality, as opposed to the concept of a changing reality, and hence movement and time, as perceived by Gabo. Mondrian, in his Plastic Art and Pure Plastic Art, 1937, writes that pure plastics are "unconditioned by subjective feeling and conception. It took me a long time to discover that particularities of subjective form and natural colour evoke subjective states of feeling, which obscures pure reality. The appearance of natural forms changes but reality remains constant. To create pure reality plastically, it is necessary to reduce natural forms to the constant elements of form and natural colour to primary colour. The aim is not to create other particular forms and colours with all their limitations, but to work towards abolishing them in the

interest of a larger unity." ⁷ Malevich referred to space that was independent of worldly objects : "In Futurism, in Cubism, space, almost exclusively, is cultivated, but its form, being connected with objectness, does not convey even to the imagination the presence of world space; its space is limited to the world space shared by things on the earth." ⁸ Lissitzky divided the creative process into 'elements' and 'inventions' ⁹; 'elements' included the cube, the cone, and the sphere, and were the basic constants from which everything was built. These, in his paintings, were three-dimensionally positioned in an abstracted space, that is to say, an infinite space purely related to these geometric abstractions. All these views lent themselves to a formal architectonic approach to the art object and its space. The sculptural manifestation of this tendency was expressed in Georges Vantongerloo's (1886-1965) constructions, which were architectonic models based on a system of mathematical proportional laws. ¹⁰

Juan Gris (1887-1927), the Cubist painter and sculptor, clarified the concepts of abstraction and pictorialism, by juxtaposing them independently within the same work, imposing representational pictorial images on geometrically constructed backgrounds. These painterly concerns were developed in three-dimensions in the work of Henri Laurens (1885-1954), Pablo Picasso (1881-1973), and Jacques Lipchitz (1891-1973). Their work was less dependent on source material, in that they invented form with metaphoric qualities. Like the Constructivists, they were concerned with space, plane, and line, but retained reference to the human figure. The American sculptor David Smith (1906-65), departed from the human figure, but retained its totemic structure in his series Cubi. Alexander Calder (1898-1976), who also worked with abstract elements in the delineation of volumes in space and their changing relationships, by means of abstracted mobile compositions, still referred to animation or gestural figuration. His use of mechanised movement differs from

that of Laszlo Moholy-Nagy (1895-1946) and Gabo, who had a more scientific approach, and whose work was stripped of any 'poetical' quality.

In that the work of Anthony Caro (b.1924) and subsequently, that of David Annesley (b.1935), Michael Bolus (b.1934), Philip King (b.1934), and Tim Scott (b.1937), may be seen to descend from the Russian Constructivists, the work of Donald Judd (b.1928) has a greater affiliation to that of Mondrian. Although Caro moved away from the totemic by structuring his work horizontally, his work retains a directional thrust. Judd rejected this 'relational' character, associating it with anthropomorphism - "a beam thrusts, a piece of iron follows a gesture, together they form a naturalistic and anthropomorphic image."¹¹ Just as there was no vestige of movement left in the compositional balance of vertical and horizontal grid structures designed by Mondrian, motionlessness was brought to its limit in Judd's minimalist objects. In his work the object became a single, constant and static identity or a repetition of identical elements devoid of any detail. The object became the image, and the phenomenological experience of form (defying systematic order or finite conclusion), was the basis of its impact. Where Gabo's work embraced notions of a conceptual order, minimalist sculpture disassociated itself from any rationalisations beyond the physically present. Jack Burnham states that "most of the short history of nonrepresentational sculpture has evolved around the mechanics of seeing according to the logic of formal analysis. Perhaps a special crisis had to appear before sculptors would begin to consider seeing as essentially an existential act by the observer. This special type of seeing is more attuned to situations than the construction of idealistic images. Through this approach the sculpted form is not an end in itself, but only the means - the vehicle - by which perceptual experiences are made possible."¹² Burnham calls this new sculpture "object sculpture", and Post-Formalist.

Having described the broad historical approaches to abstraction, I propose, in the following paragraphs, to give an account of the development of the 'art object', in terms of specific works by a Constructivist, Vladimir Stenberg (b.1899), a Cubist, Jacques Lipchitz, and the Post-Formalists, Annesley, and Bolus; and to relate this to the development of my work.

3.2 CONSTRUCTIVIST ABSTRACTION : VLADIMIR STENBERG

The Constructivist object acknowledged technology as a guiding influence in terms of source, materials, and process. The artist was to rationally organize his data with mechanical precision and economy, as opposed to emotional or mystical manipulation. The application of materialist theoretical doctrines to recreate a new socio-political structure was synonymous with the goal and process in the visual arts. The expression of this materialist attitude led to the making of a collective, practical art which held technology as its directing guide, symbolising this new outlook. The forms arising out of the development of the new visual language were adapted to a more utilitarian approach, culminating in 'design'. Arvatov, a Constructivist theorist, wrote that "the artist calculates, draws, scientifically plans his every step,... he ceases to depend on his moods, his subjective empathies and antipathies - in a word, the process of artistic production is socialised."¹³ The materials from which the artwork was constructed were industrial and therefore real, as opposed to traditional art-related materials such as bronze and stone. The process of assemblage and the inherent properties of the material resolved sculptural form. Sculptural elements were to have a plastic value, as opposed to a pictorial value, and similarly, colour was to be non-referential and independent, employed in the same manner as material components.



illus. 1

This feature, as well as the use of line and plane to 'draw' in space and the concern with technological structures, were the beginning of the modernist trend of combining the formal elements of drawing, painting, sculpture, and architecture in a single discipline.

The group of Constructivists to whose work my own is most closely related were members of OBMOKHU, the Society Of Young Artists, established in 1919. Their most notable exhibition opened on 22 May 1921, and included work by Alex Michajlowitsch Rodchenko (1891-1956), Kasimir Medunetzky (1899-1935), Georgii Stenberg (1900-1933), and Vladimir Stenberg.

Many of the works shown in this exhibition were free-standing structures. Of these, Vladimir Stenberg's Construction for a spatial structure No.6, 1920 (illus.1), is based on a structure reminiscent of a crane, a subject which I have developed in my own work. Stenberg's piece is mathematically constructed of uniform metal strips which delineate space, and is comparable to the spatial drawings for the initial structures included in my submission (Nos.1,2,4, and 5). Economy of design and the reductionist handling of forms are common to these structures. Formal parallels also exist in the exploration of movement in Stenberg's piece, which tapers diagonally from the base to the apex, and certain of my sculptures such as No.1 Lift and No.2 Train, in which the movement is vertical and horizontal respectively. The process of reducing a principle to a graphic motif based on the function of the original, and thus evolving a sign system, is comparable to the influence of mathematical models on certain Constructivists in transposing cerebral processes into concrete visual terms. In works such as No.1 Lift, No.2 Train, and No.3 Crane 1, strips, rods, and flat planes have been organised into balanced compositions that signify the dynamism of functional movement. This balanced and structured 'objecthood' in a sense defies further abstraction.



illus.2

3.3 CUBIST ABSTRACTION : JACQUES LIPCHITZ

Jacques Lipchitz made numerous sculptures of the human figure which show a linear progression in the exploration of sculptural language - syntax changing from piece to piece, despite a common source. In 1915 he made a series of detachable figures which were originally constructed out of different materials, such as wood, metal, and glass, and later cast in bronze. Bather 1915, and Dancer 1915 still expressed Analytical Cubist concerns, in that they employed superimposed organic planes which echoed the shallow faceted surfaces of Analytical Cubist paintings. However, Lipchitz acknowledged the process of assemblage by expressing mechanical joints. Lateral views of a figure were presented frontally, side views were cross-sectional, recurring elements in my own work, especially in No.2 Train. Pierrot 1915 (illus.2) was conceived in the round, but the thin flat planes suggested rather than represented volume. This marked the beginning of the Synthetic Cubist concern with the spatial interplay of form. Planes were rectangular and circular, and intersected perpendicularly; detail was eliminated, and the figure was rationally geometrized. A similar break with flat construction in my work begins with No.5 Headgear, and flatness has been eliminated in works such as the Locomotives (Nos.10-13).

Pierrot with clarinet 1926 (illus.3), by Lipchitz, was a mature Synthetic Cubist sculpture. The subject was described by cut-out shapes which expressed, in negative and positive forms, a figure in space. These forms were not dependent on an understanding of the subject, and took on a metaphoric quality. Shapes were invented with playful ambiguity, as opposed to being analytically descriptive. Although they retained an associative quality, they were evocative of more abstract emotional or vital qualities. Identifying features, such as eyes and hands, were reduced to signs;

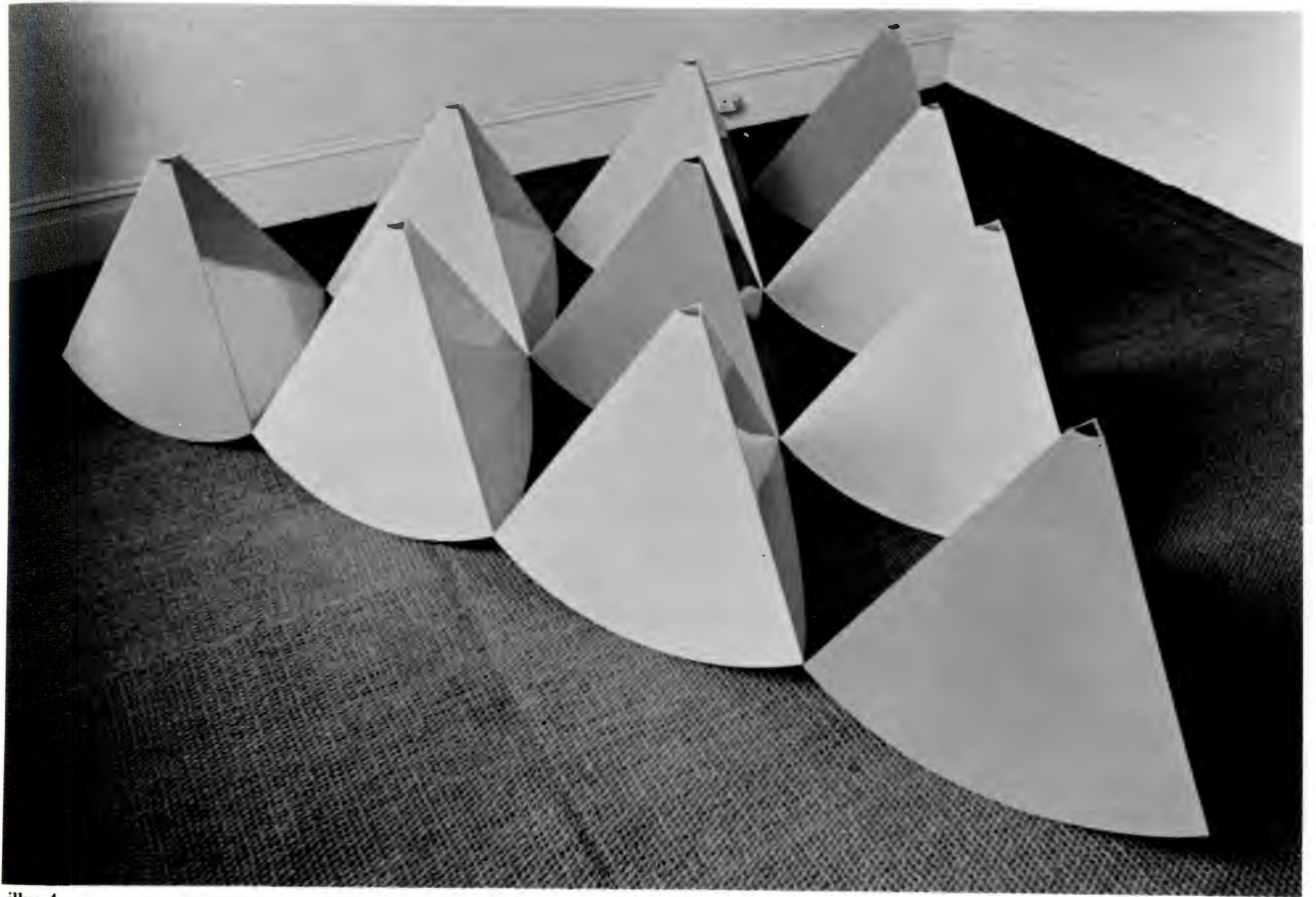


illus.3

eyes were cut out of a flat plane resembling a mask, and the nose was made in the negative. A greater inventiveness with formal language occurs in later works in my submission such as No.13 Synthesis 1 and No.14 Synthesis 2. The Cubist synthesis between invented shapes and identifying signs is echoed in these sculptures. Although joints have been eliminated to remove mechanical allusions, and forms have been changed and inverted, the sculptures retain, for example, the circle and half-circle with their extended mechanical meanings. The pistons may be compared to the Pierrot's arms, in the reduction to thinner bars and unarticulated joints. Manipulation of open form, and the ambiguities of implied mass and space, are apparent in No.13 Synthesis 2, where, because of compression or extension of parts, specific concentrated form becomes elusive. The eye reads both negative and positive form simultaneously. The enlargement and positioning of the flywheel in No.13 Synthesis 1, may be compared with the triangular 'backdrop' to the Pierrot - both shapes having been decontextualised.

3.4 POST-FORMALIST ABSTRACTION : DAVID ANNESLEY AND MICHAEL BOLUS

In approaching the Post-Formalist sculptural object, the act of perception is of primary importance. These objects are generally radically reduced, with little extraneous detail to detract from their impact. They are abstracted in that their form does not imitate any a priori natural image, but this abstraction also does not allude to the transformation of a concept, or the 'scientific idealism' of Constructivism, as Burnham calls it.¹⁴ Response to these works is immediate, and involvement is focused on what is physically present. The artist controls the whole process, from the conception of the image to its manifestation. This approach is characteristic of the work of

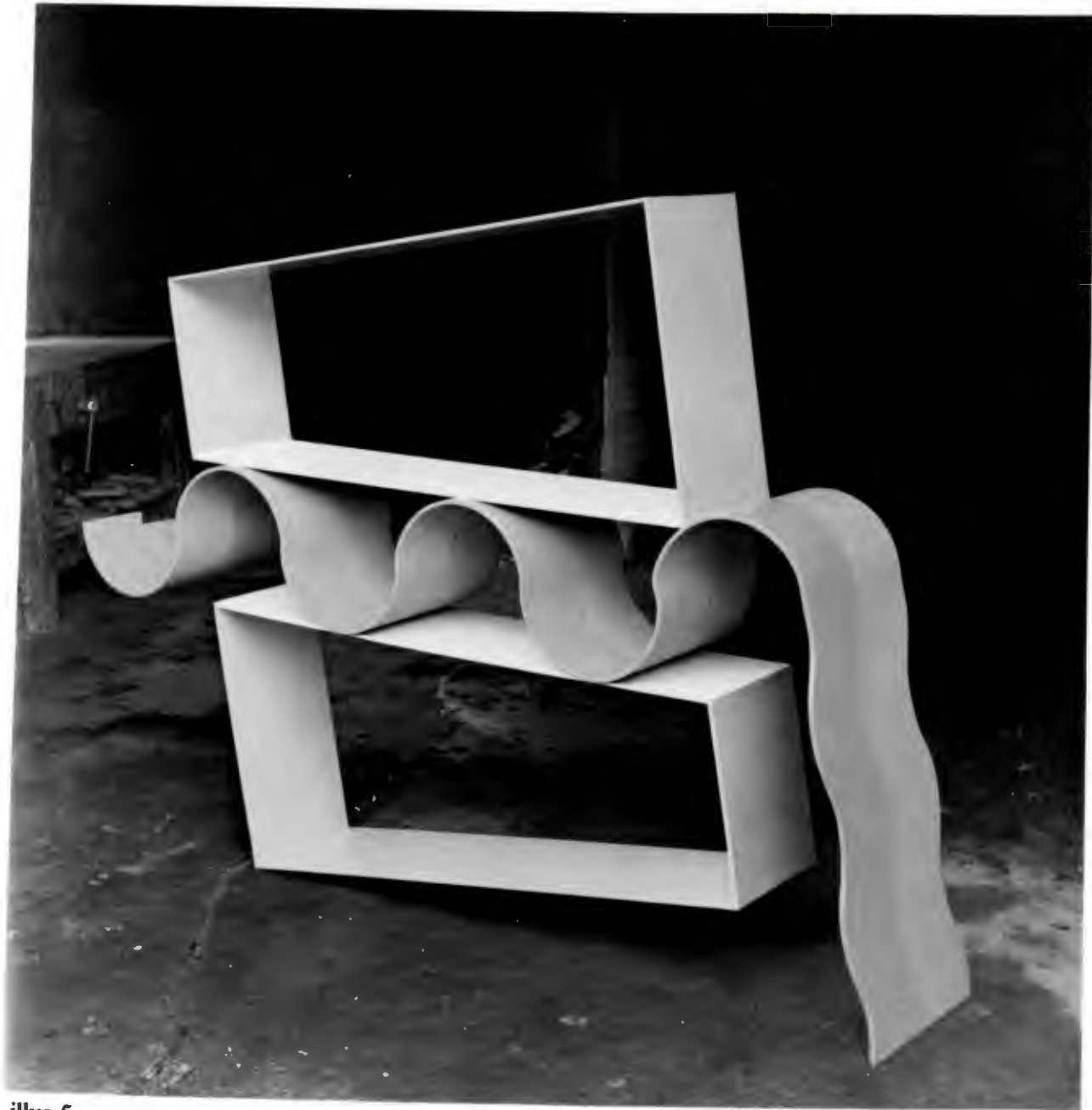


illus.4

Annesley, Bolus, Scott and King, in contrast to the work of Caro which allows for gestural expression that arises out of the creative process. The process of refining an image before its fabrication, and the resultant 'design quality', is equivalent to that employed in my work generally. Concentration on exact proportional relationships and the composition of specific elements, is similar in both Annesley's and my own. In my work the required act of perception does not necessarily extend beyond the visual information offered.

The materials preferred by the Post-Formalists are industrially manufactured and without associative meaning. In their work there is no formal analysis, rather, each sculpture is an independent fact. Colour is applied flatly in non-referential bright hues, neutralising the materiality of the underlying metals, and becoming integral with shape. Annesley uses colour to differentiate structural elements, Bolus characteristically applies a different colour to either side of a thin sheet of metal. Similarly, colour, in my sculptures, follows a system in 'coding' formal elements, and Bolus's dual use of colour is reflected in my No.7 Beam Engine.

These Post-Formalist artists have in a sense reinstated the 'objectivity' of sculpture in their approach to the realism of plastic qualities. Standardised materials, in standardised shapes, are painted standardised colour with a factory finish. Understanding these works is comparable to understanding industrially manufactured consumer goods, but the synthetic form is paradoxical and by reduction to a minimalist degree an element of mystery is introduced. Thin sheets of metal are used, either in weightless open form or in flat shapes. If volumetric form is used, it is generally hollow and recurringly emphasized as such. In Bolus's 4th Sculpture 1966 (illus.4), the tops of the pyramids have been cut off to reveal this hollowness, and Swing Low 1964 (illus.5), by



illus.5

Annesley, is precariously balanced at an angle which defies gravity. Formal paradox also occurs in my own work, and extends to the concept of the seemingly rational machine which remains functionless. Formal consistency of design in my work implies a specific meaning, but this remains ultimately elusive. No.8 Cultivator 2 perpetuates this barrier to specific meaning, with its raised harrow and cantilevered body insubstantially supported by a single wheel. The elimination or reduction of mechanical information, as for example in No.12 Road Locomotive 3, also enhances this elusive quality.

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4 WORKING METHOD

...the concepts of each aspect was diagrammatically expressed as a graphic facade, referring to the perceived functional principle. In the later work, functional analysis was expressed by a system of oriented and structural forms. In each case the subject was taken either from a single image or a group of related images. These images were two-dimensional illustrations, and therefore inherently diagrammatically simplified, allowing a further discussion of specific restrictions. Problems of necessity were taken into consideration at this point, contributing to the evolution of the structural forms.

Small rectangular pieces of aluminum sheet, sections and rods, were employed to realize three-dimensional prototypes and exact proportions.

While working drawings were made, for some components, as many as four drawings were needed. These started as line drawings and were subsequently painted with enamel paint to determine colour coding.

The working method was essentially logical. The process of construction was carefully planned before any action. The cutting of elements, drilling, cutting, and making of joints, was followed by a precise, critical order of assembly. Certain elements were painted before joining. In the earlier sculptures, all parts were painted before assembly. Cylindrical forms were fabricated individually by extrusion.

As a process was planned, then, the process required was unambiguous. Codes of colour were systematic, avoiding all weathering. Individual images served to group structural elements into

By means of analytical drawings the concept of each subject was diagrammatically reduced to a graphic formula, referring to the perceived functional principle. In the later work, functional analysis was replaced by a synthesis of invented and mechanical form. In each case the subject was taken either from a single image or a group of related images. These images were two-dimensional illustrations, and therefore already diagrammatically simplified, allowing a further elimination of specific references. Problems of assembly were taken into consideration at this point, contributing to the evolution of the ultimate form.

Small maquettes made of aluminium sheet, sections and rods, were employed to resolve three-dimensional problems and exact proportions.

Scale working drawings were made. For some sculptures, as many as four drawings were needed. These started as line drawings, and were subsequently painted with enamel paint to determine colour 'coding'.

The working method was essentially logical. The process of construction was carefully planned before execution. The cutting of elements, drilling, slitting, and making of parts, was followed by a predetermined order of assembly. Certain elements were painted before joining. In the earlier sculptures, all parts were painted before assembly. Cylindrical forms were fabricated industrially to my specifications.

All elements were painted. Paint was applied neutrally and unexpressively. Choice of colour was systematic, avoiding decorative use. Individual colours serve to group structural elements into

types, for example yellow and red denote movement throughout. No.5 Headgear is painted tonally. In the last six sculptures, Nos.10-15, both a tonal and non-tonal system was employed, and colour was used to differentiate flat planar shapes from volumetric forms. Quality of paint surface varies between gloss, egg-shell and matt.

Initially abstraction in my works was rendered by means of the extraction of a functional essence into a concise graphic motif, by reduction and reorganisation of plastic elements. Technological and industrial structures were selected for the functional implications inherent in their form, giving access to imagery specifically related to functional principle. Subsequently, mechanical objects chosen where single, volumetric entities. Abstraction of these was brought about by means of assimilation of formal characteristics into a specific image. In these works the degree of formal reduction eliminates notions of functionality. Works Nos.13-15 were derived from these processed images, but developed further by formal innovation, resulting in 'new objects'. Their objective presence, in the actuality of materials and formal specificity, asserts a 'reality' which denies further modification, unlike constructivist images whose parts may be extended to an infinite variation of relationships.

5 DOCUMENTATION AND
NOTES ON INDIVIDUAL PIECES



No.1 Lift

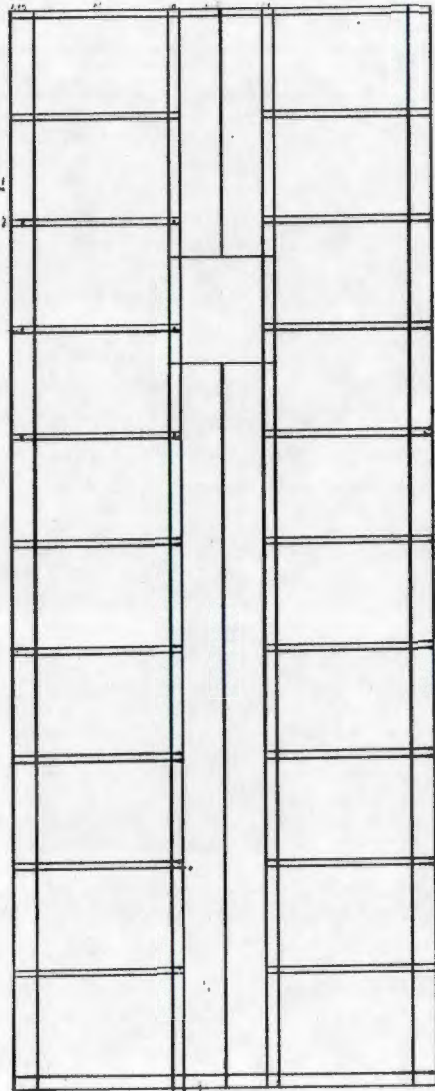
815 x 550 x 310 mm*

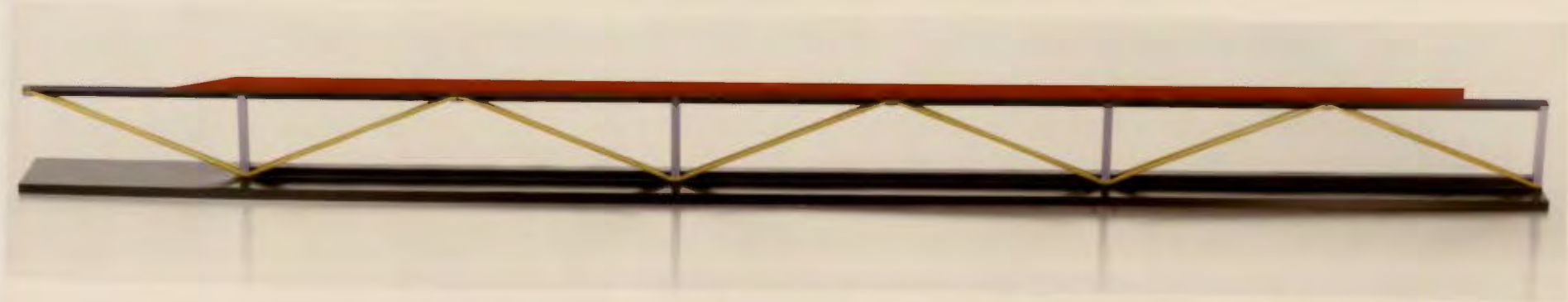
Aluminium square-section extrusion, aluminium angle, strip, rod, sheet; enamel paint.

Notes: The intention was to express the vertical movement of a lift, enclosed in a shaft.

The supporting structure was diagrammatically reduced to a skeletal grid of vertical and horizontal strips, which signified architectonic division of space. The lift-shaft was unobstructed by the horizontal strips in order to emphasise vertical implied movement. The 'cars' were simplified into thin squares, suspended by rods which penetrated them and joined the structure top and bottom. Elements were joined by rivets. Colour denoted function. For example, flat red referred to architectonic function, acid yellow signified secondary movement.

* All dimensions are in millimeters,
height x length x width.





No.2 Train

160 x 2115 x 100 mm

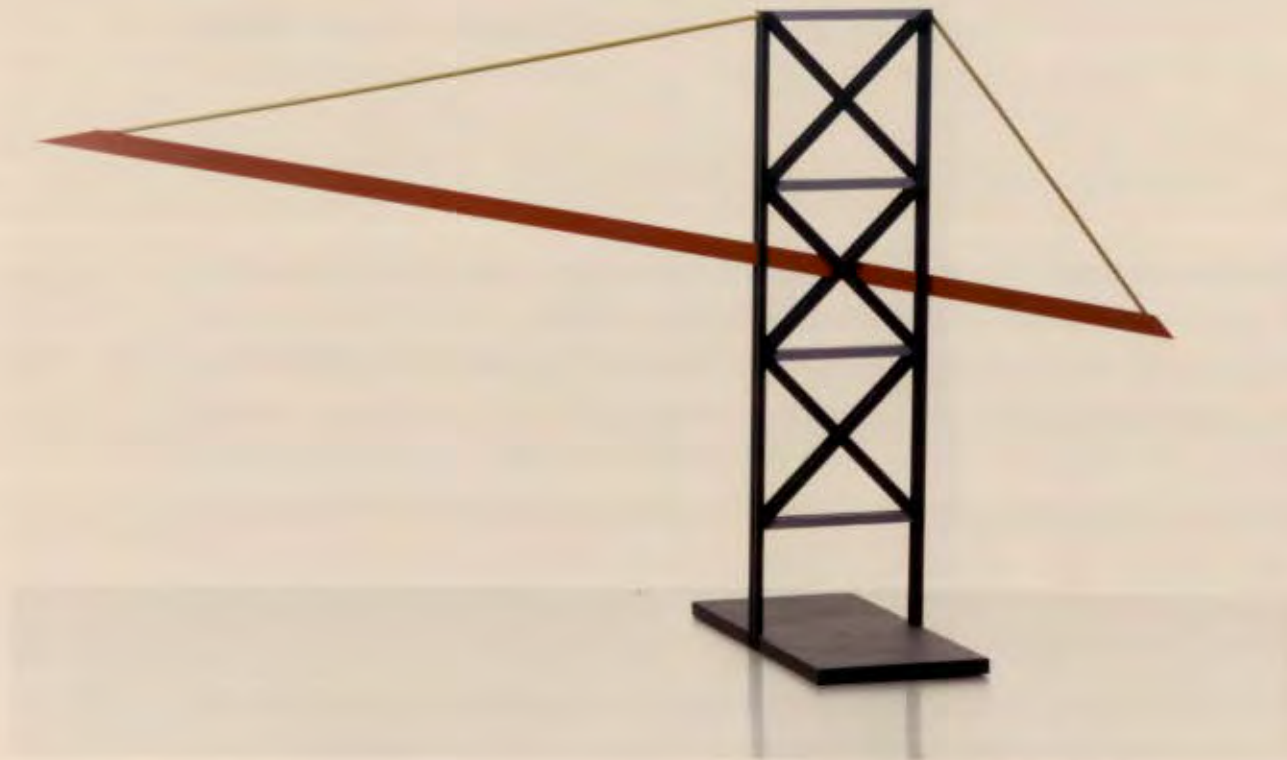
Aluminium sheet, strip, angle; enamel paint.

Notes : The intention was to organise and reduce the source image into a linear composition, signifying horizontal movement.

A strip of aluminium, 0,5 mm thick, painted flat red, denoted the train. Movement was expressed by this and by acid yellow diagonals. Secondary movement was delineated by a zig-zag line, visually elongated by the proximity of the train to the base, and the intervals at which diagonals met the lilac verticals. Shape was intentionally elongated to signify speed. The structure was closed at the rear end to signify completion of movement; at the front, the diagonal ended in an upward movement, suspending the front of the train above the base to indicate space to be traversed.

In this work drawing, painting, and sculpture were synthesized. The sculpture was a drawing in space, there were flat and linear painted elements, but it was free-standing and existed in real space. Viewing was lateral; the front view was cross-sectional.





No.3 Crane 1

765 x 1400 x 430 mm

Aluminium sheet, angle, strip, rod, bar; enamel paint.

Source : An illustration of a Thirty-cwt Temperley Transporter.

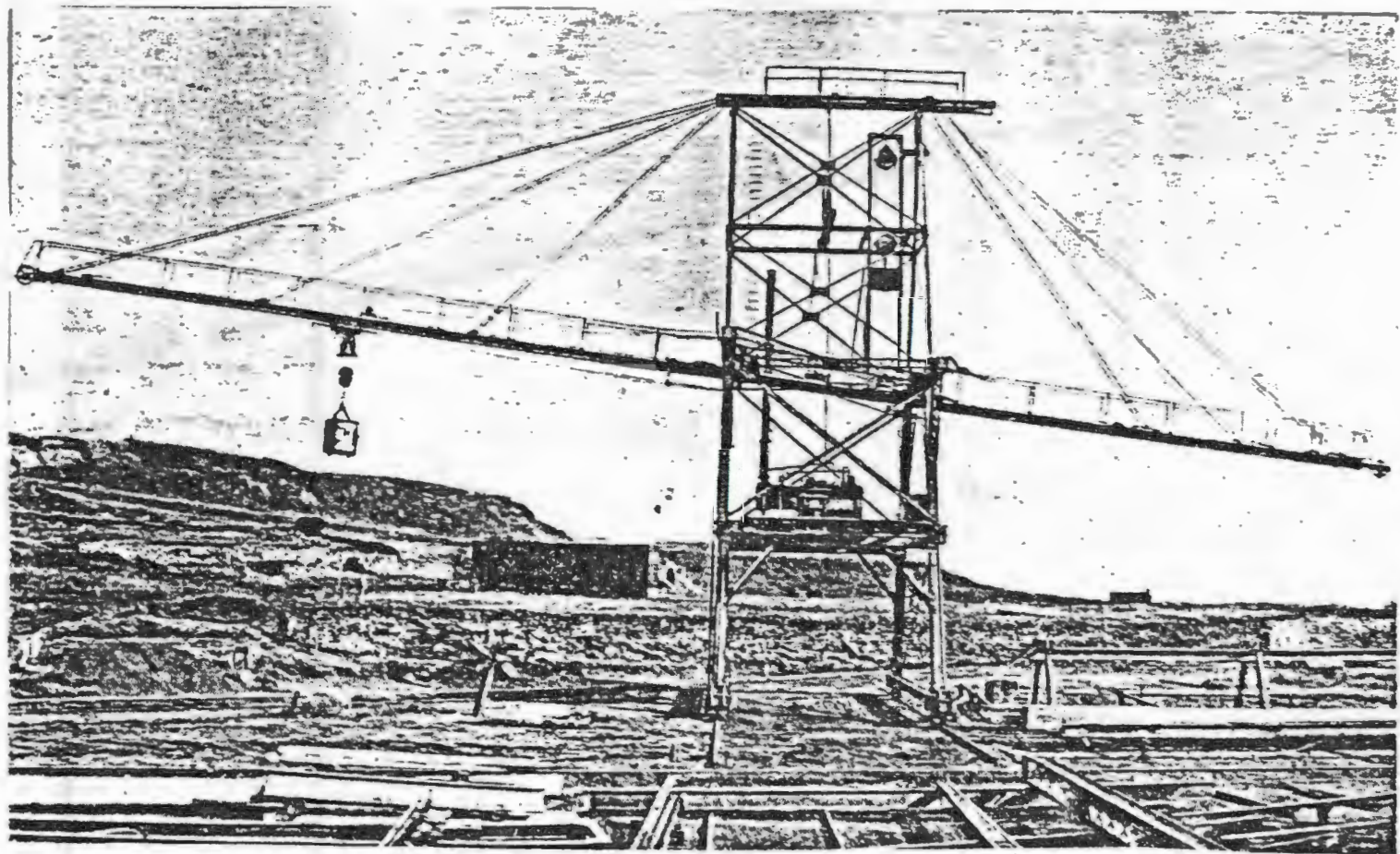
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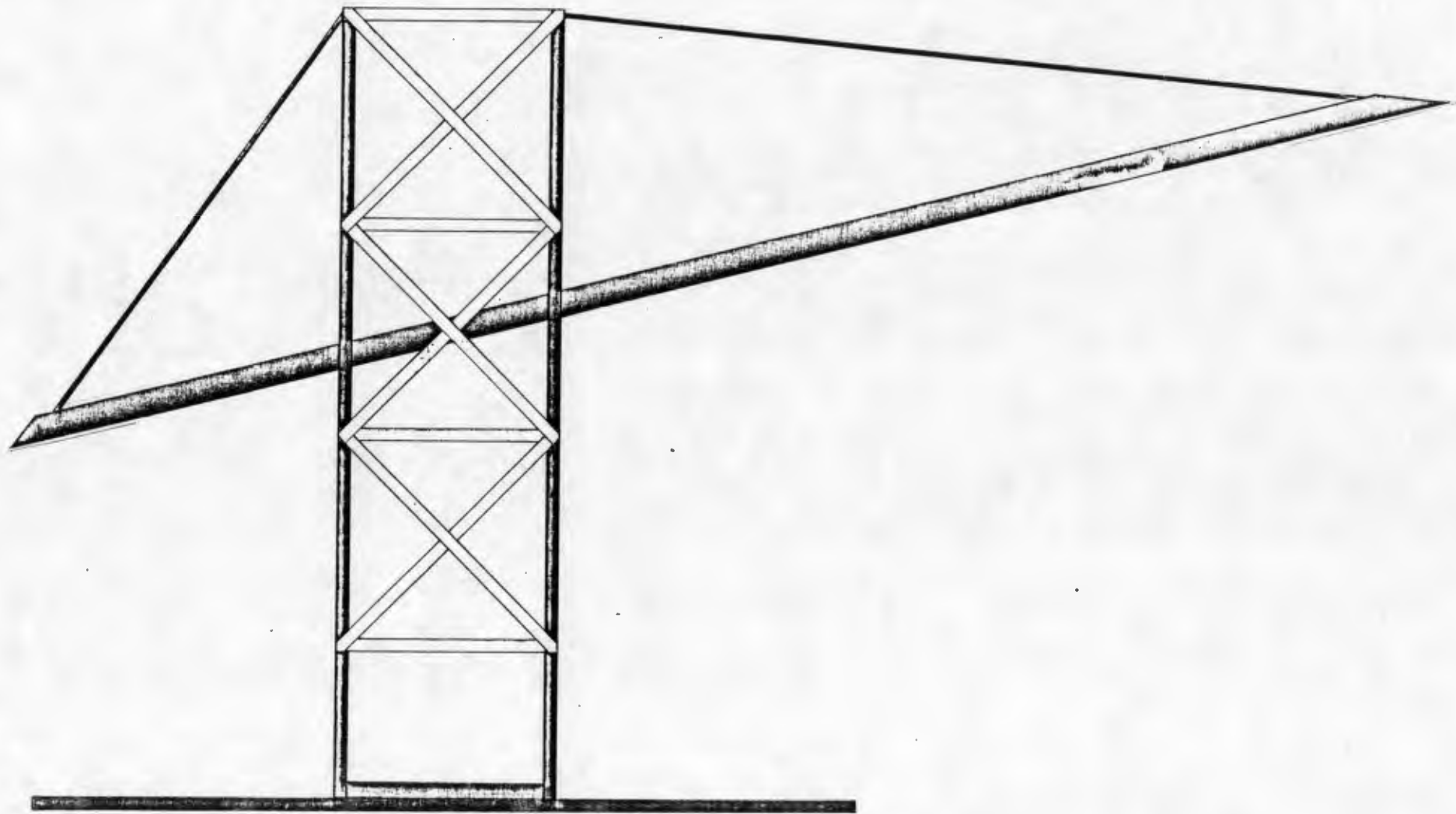
London : Crosby Lockwood and Son, 1903. f. p 240. (see illus. over)

Notes : The intention was to work primarily with line, incorporating a strong diagonal.

The subject was reduced to two sets of two verticals crossed by four horizontals, forming a grid pattern of three squares, and then semi-structurally held by criss-crossing strips. The diagonal bar was pinned in between the verticals and, being only 2.5 mm thick, the space between grid structures became very narrow. The diagonal was also held by rods on either side; these were pinned in turn, into blocks at the topmost corners of the supporting structure. This resulted in a negative triangular form penetrating a negative rectangular form. The base thrust out perpendicularly to the movement of the diagonal, creating a duality of perceived space. Colour followed the system applied in No.1 Lift and No.2 Train.

This sculpture was radically compressed, with main viewing as lateral, as in No.1 Lift. The thrust of the diagonal was counter-balanced by the main frame, defeating expressive movement.







No.4 Crane 2

1020 x 800 x 150 mm

Aluminium sheet, rod, bar; enamel paint.

Source : An illustration of an Electric Horizontal Crane (Thomas Smith & Sons, Rodley).

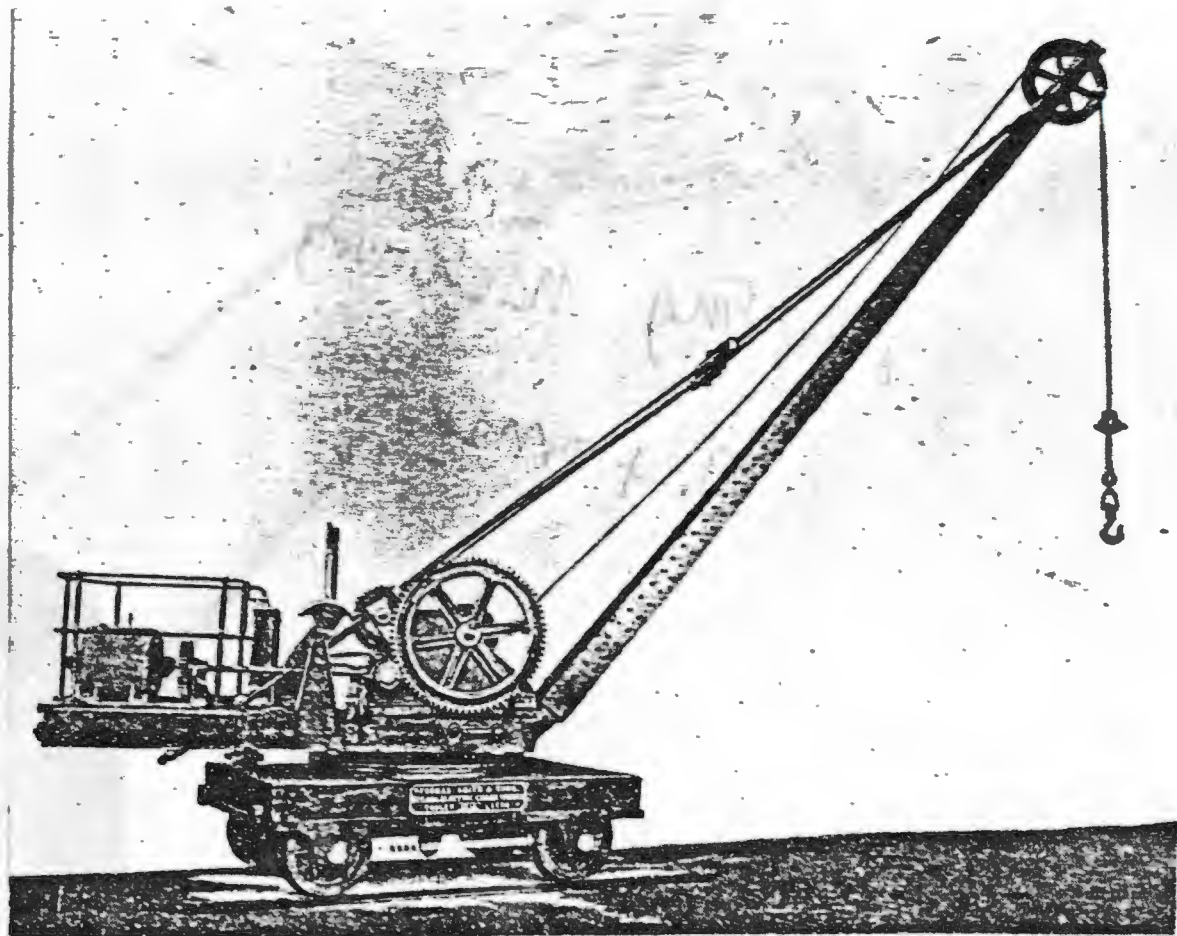
Horner, J. An Elementary Treatise on Hoisting Machinery. London : Crosby Lockwood and Son, 1903.
f. p 224. (see illus. over)

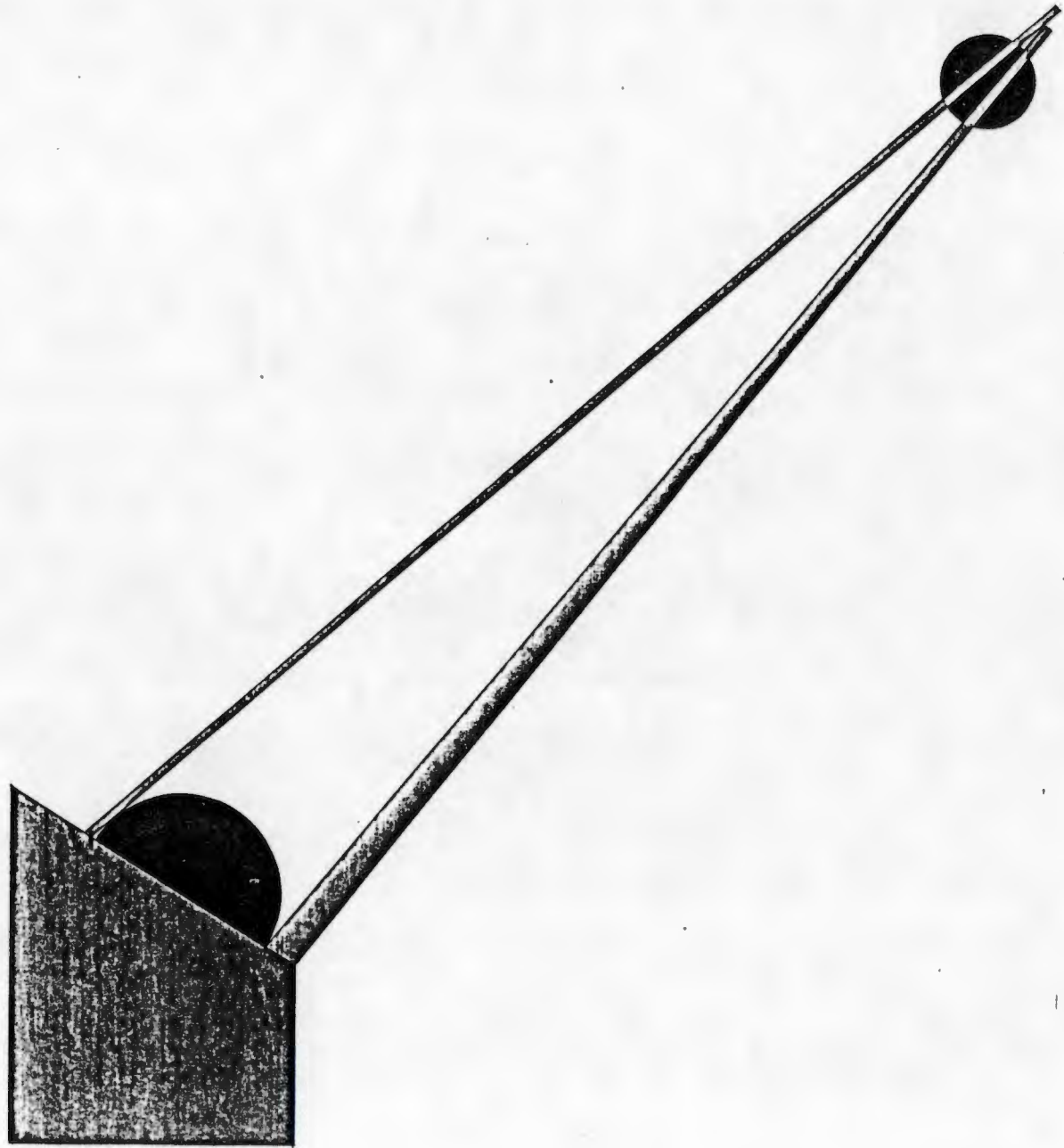
Notes : The intention was to reduce the subject to a limited number of specific elements with the introduction of volumetric form.

The base was simplified into a broken cubic form, becoming an integral part of the sculpture, formally and functionally. Other elements chosen were a semi-circle, circle, rod, and bar.

There was combined use of volume, planar shape, and drawn line. The wheel was slotted half-way through the centre of the cube, allowing for integration of form. The diagonals were pinned to the face of a disc.

This was the first free-standing sculpture, as well as the first not to employ repetitive elements.







No.5 Headgear

1250 x 1015 x 130 mm

Aluminium sheet, bar, rod; wood; enamel paint.

Source : Photograph of mine headgear by Bernd and Hilla Becher, 1976. (see illus. over)

Notes : Despite functional connotations, a more playful 'architectonic' approach was intended.

Architectonic and mechanical elements were expressed by means of circles, rods, planes and diagonals. The resulting image was especially influenced by structural problems and all elements were structurally interdependent. The meeting of the diagonal conveyor belt and the top wheel was suggestive of functional meaning. This motion was flanked by two thin rods forming triangles over the wheel, as well as by two wide, squat, ribbed columns. The main rod penetrated two horizontal planes, and both rod and planes were in turn interpenetrated by circles. Joints were expressed as important features, unlike the previous sculptures. Colour was also used differently, five tones being employed to emphasise structural differences.

Sculptural space was less compressed. The sculpture did not imply functionality although it incorporated elements of an industrial structure. This marked the beginning of a movement away from the graphic motif expressing a single definite function.





No.6 Cultivator 1

300 x 1320 x 350 mm

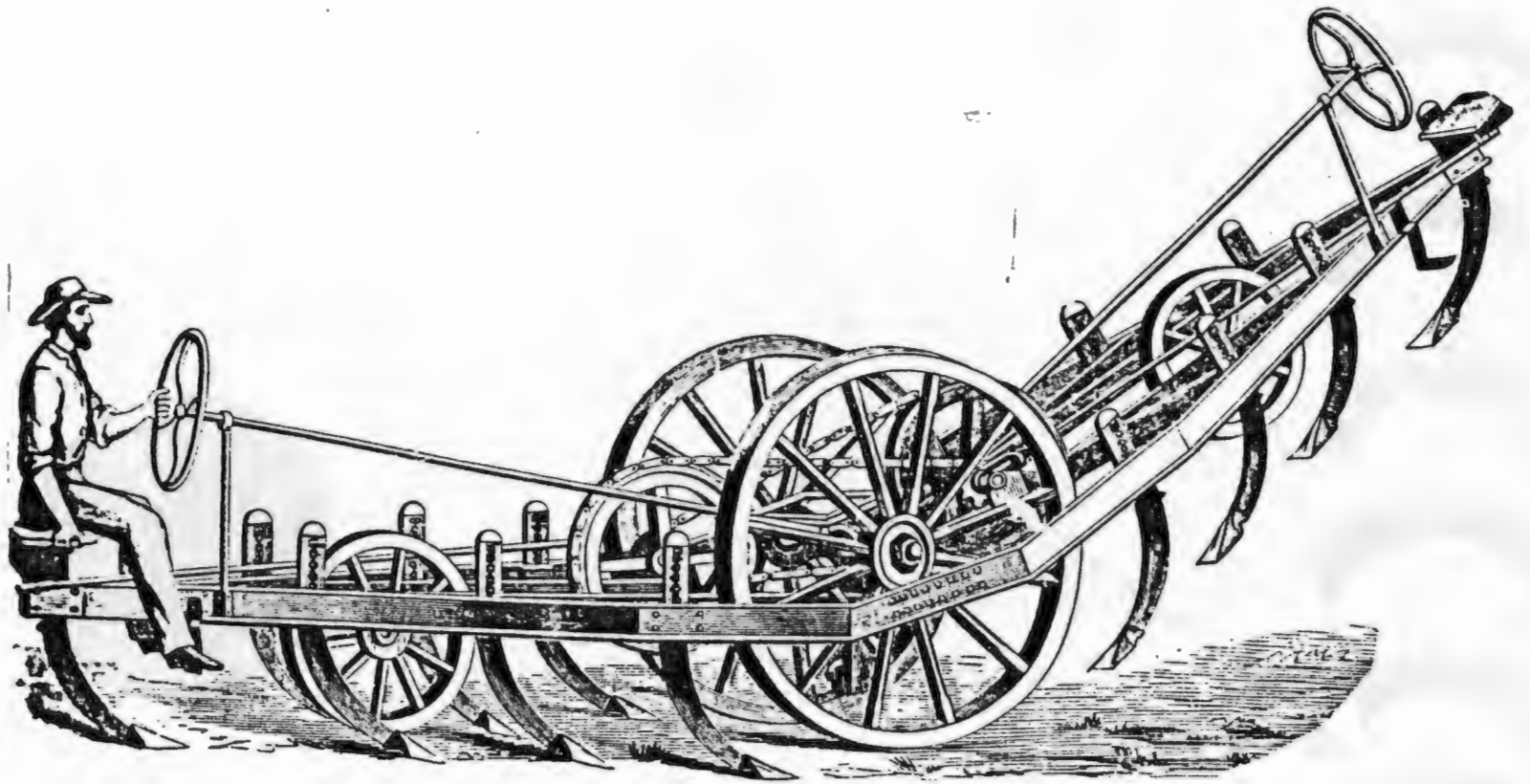
Aluminium sheet; enamel paint.

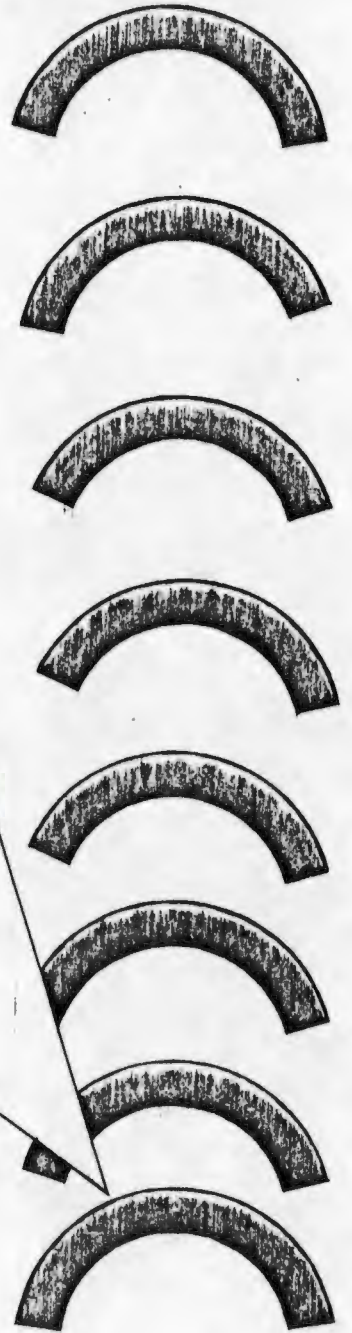
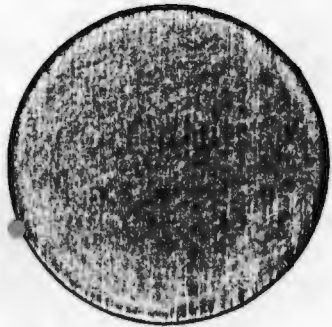
Source : An illustration of Fowler's Balance Cultivator. Johnson, P. Farm Inventions in the Making of America. Iowa : Wallace Homestead Book Company. (see illus. over)

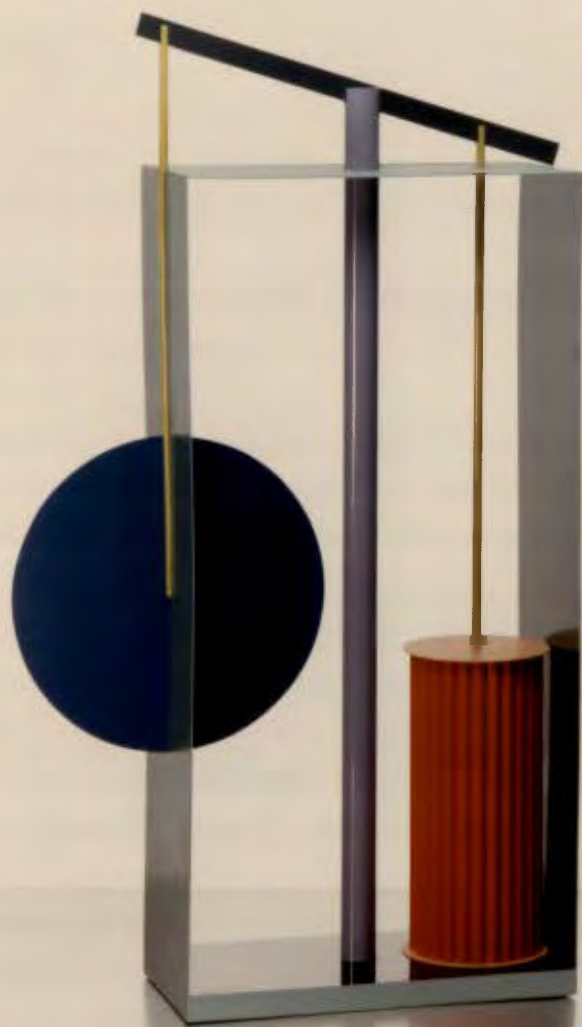
Notes : The intention was to modify the form of the subject without losing the functional principle and inherent qualities of the original.

The source image depicted the cultivator as linear, with alternating horizontal and diagonal movements on either side of the central axis. This was simplified into a flat, planar shape, lying parallel to the ground. The sculpture stood on curved flat strips representing tines, and on two large circles at the centre with the same radius as the tines. Material was restricted to sheet; 'legs' and circles slotted into the main form. The horizontal plane was intersected perpendicularly by the other elements.

The formal consistency implied rationality, but meaning and function remained enigmatic. The sculpture existed in deep space despite the thin material.







No.7 Beam Engine

1050 x 500 x 210 mm

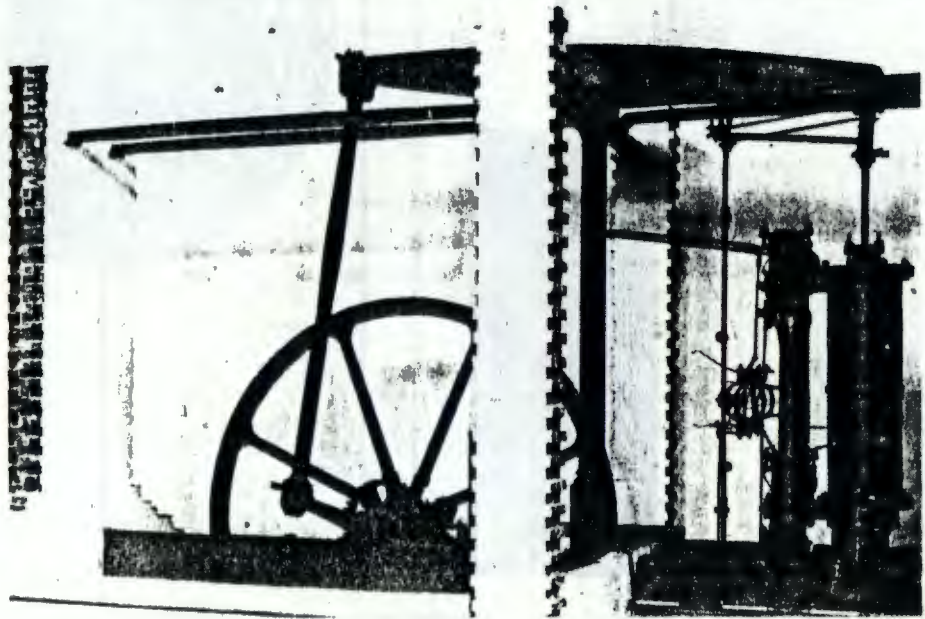
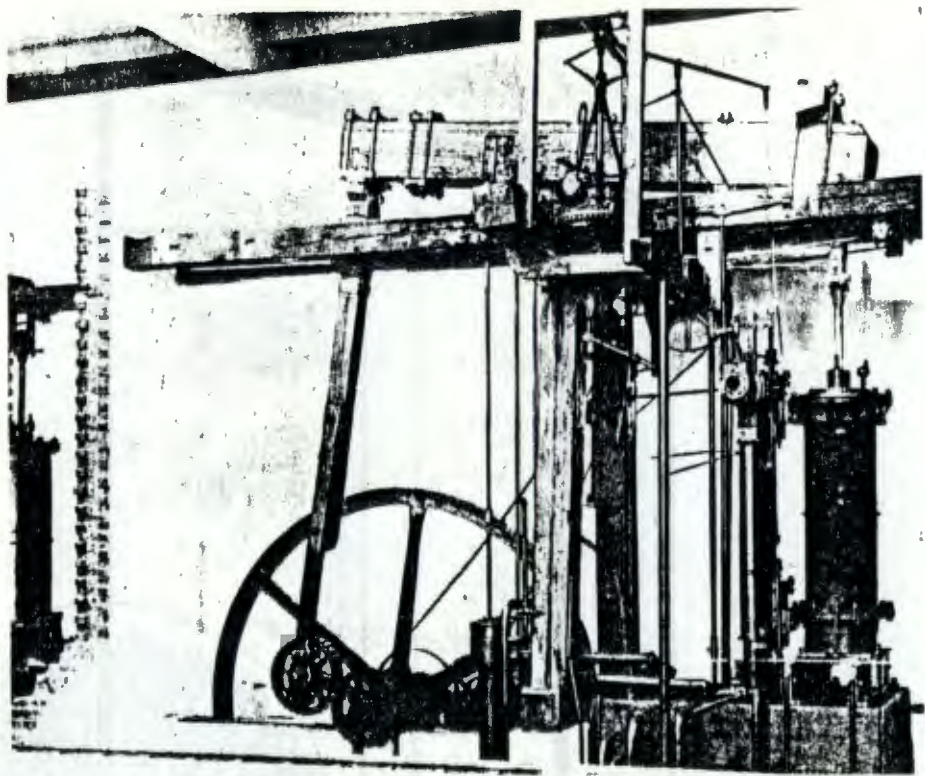
Aluminium sheet, rod, bar; mild steel; enamel paint.

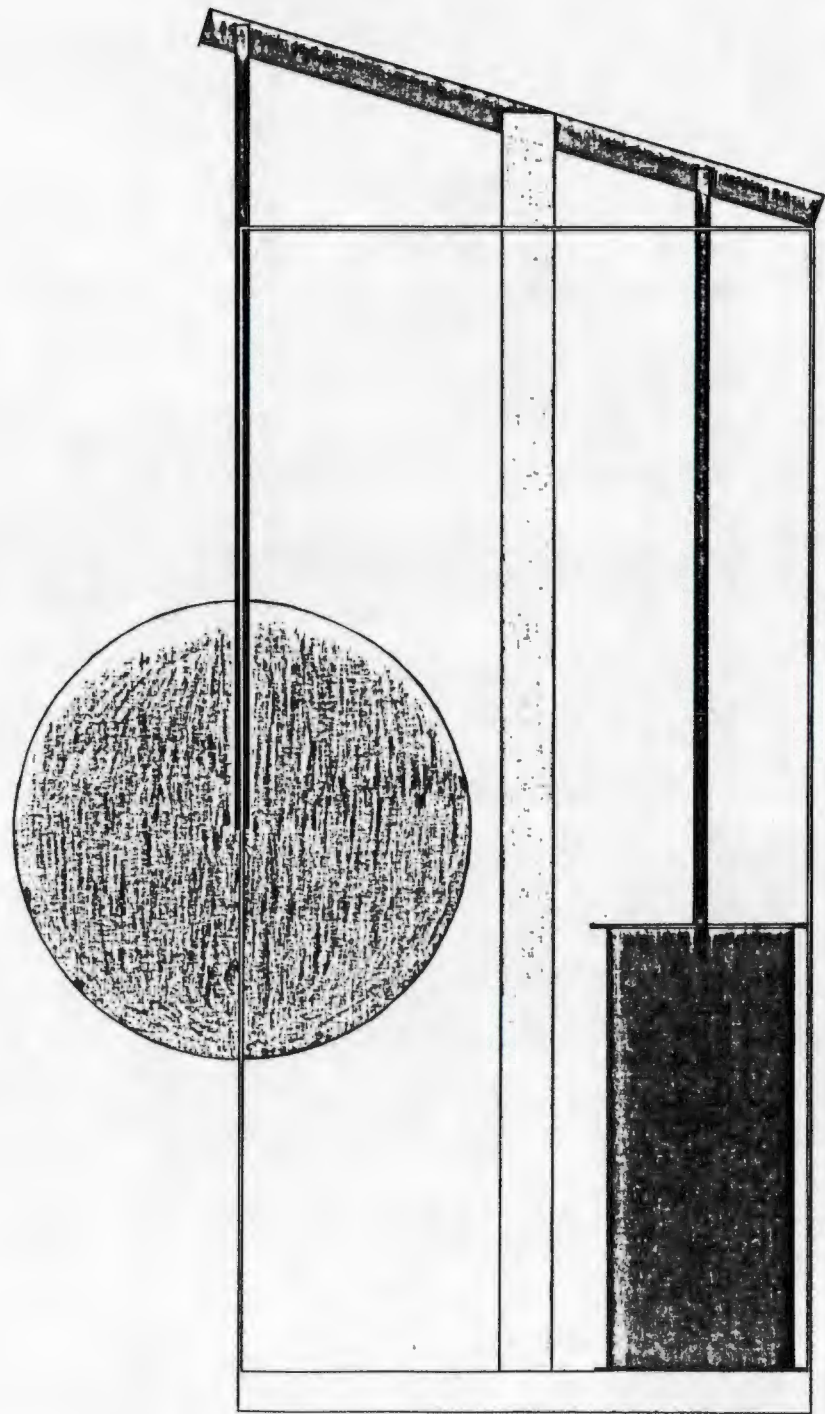
Source : Illustrations of beam engines. Crowley, T.E. Beam Engines. Aylesbury : Shire Publications, 1982. p 15. (see illus. over)

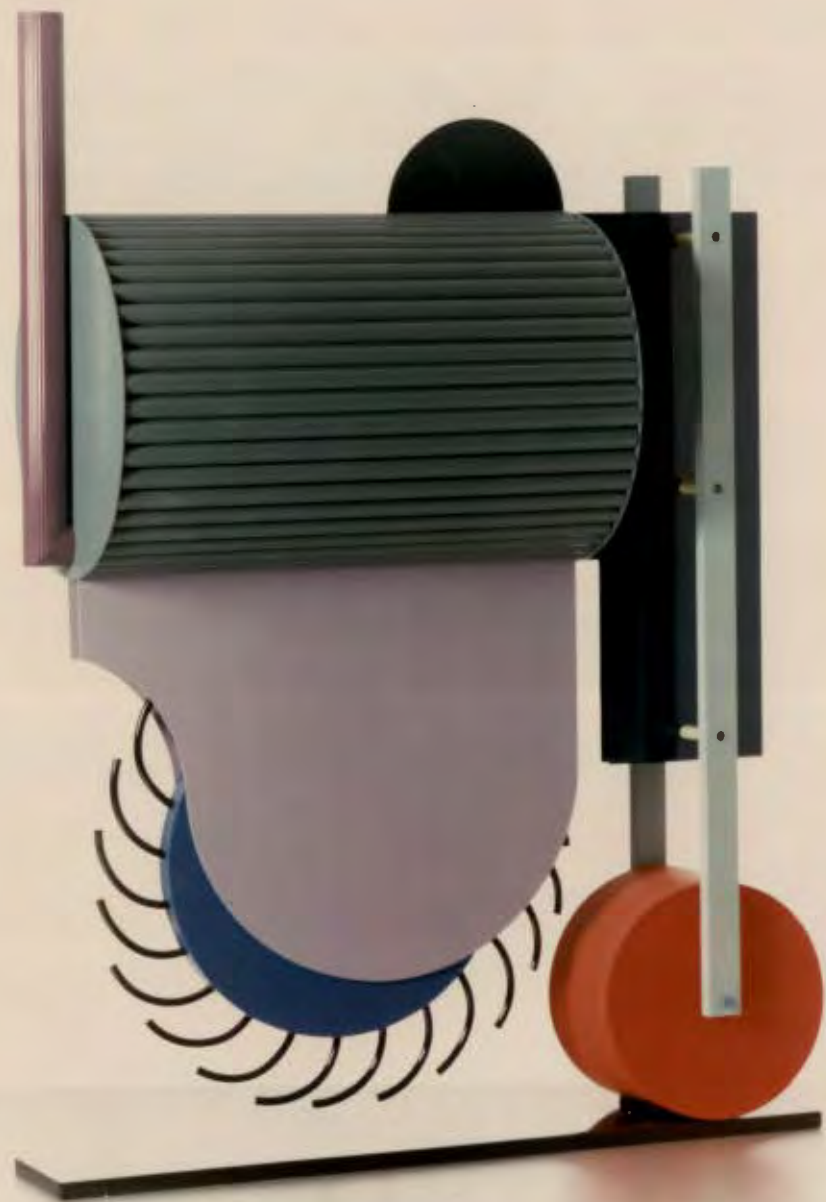
Notes : Interest lay in mechanical motion within an architectural structure, as well as the visual effect of machine parts interpenetrating architectonic form. The intention was to achieve a reduced form of the functional principle of the source image.

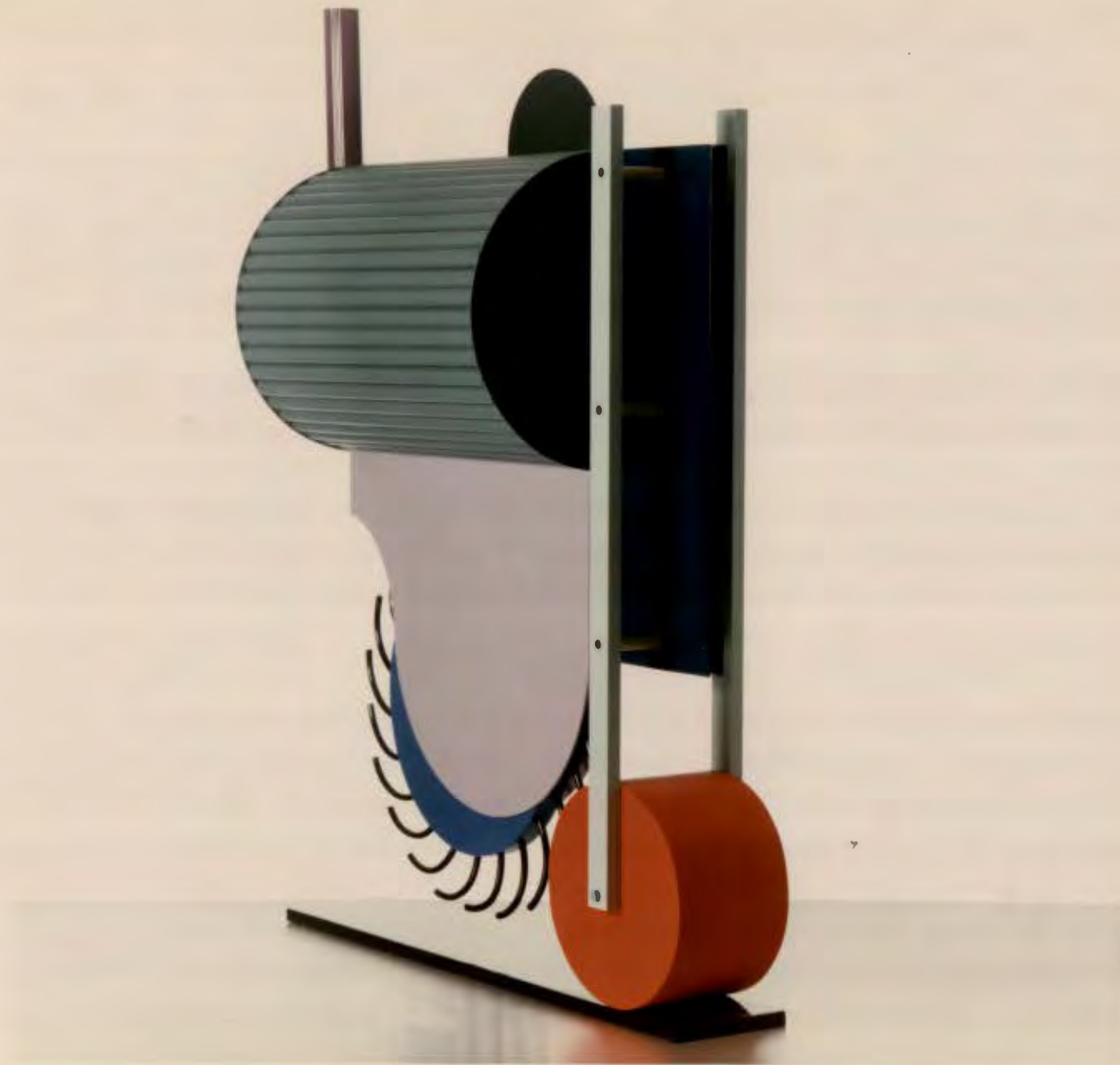
Extraneous mechanical and architectonic information was eliminated. The final image was limited to a circle, a cylinder, and the column supporting a beam and piston rods. These were arranged within a rectangular space defined by a length of sheet bent to form outer walls. The main column perforated the roof, and outside the structure the diagonal beam implied upward and downward movement. The piston-rod, running from the centre of the wheel to the beam, was cut in half and attached to either side of the wall, suggesting movement through the plane of the wall. The cylinder was elaborated by the addition of half-round sections. The wheel and the cylinder, as key elements in the opposing movement of the beam, were painted in contrasting primary colours - red and blue, respectively. The column was painted a tertiary lilac. Architectonic elements were defined by dark and light grey.

This sculpture was a radical reduction of the mechanical process contained in the source image.









No.8 Cultivator 2

805 x 585 x 255 mm

Aluminium sheet, rod, tube, bar; mild steel, wood, styrofoam; enamel paint.

Source : An illustration of Parker's apparatus for the cultivation of land, 1858. Roberts, D. Lumbering On The Land, The New Era Found The Going Heavy. p 78. (see illus. over)

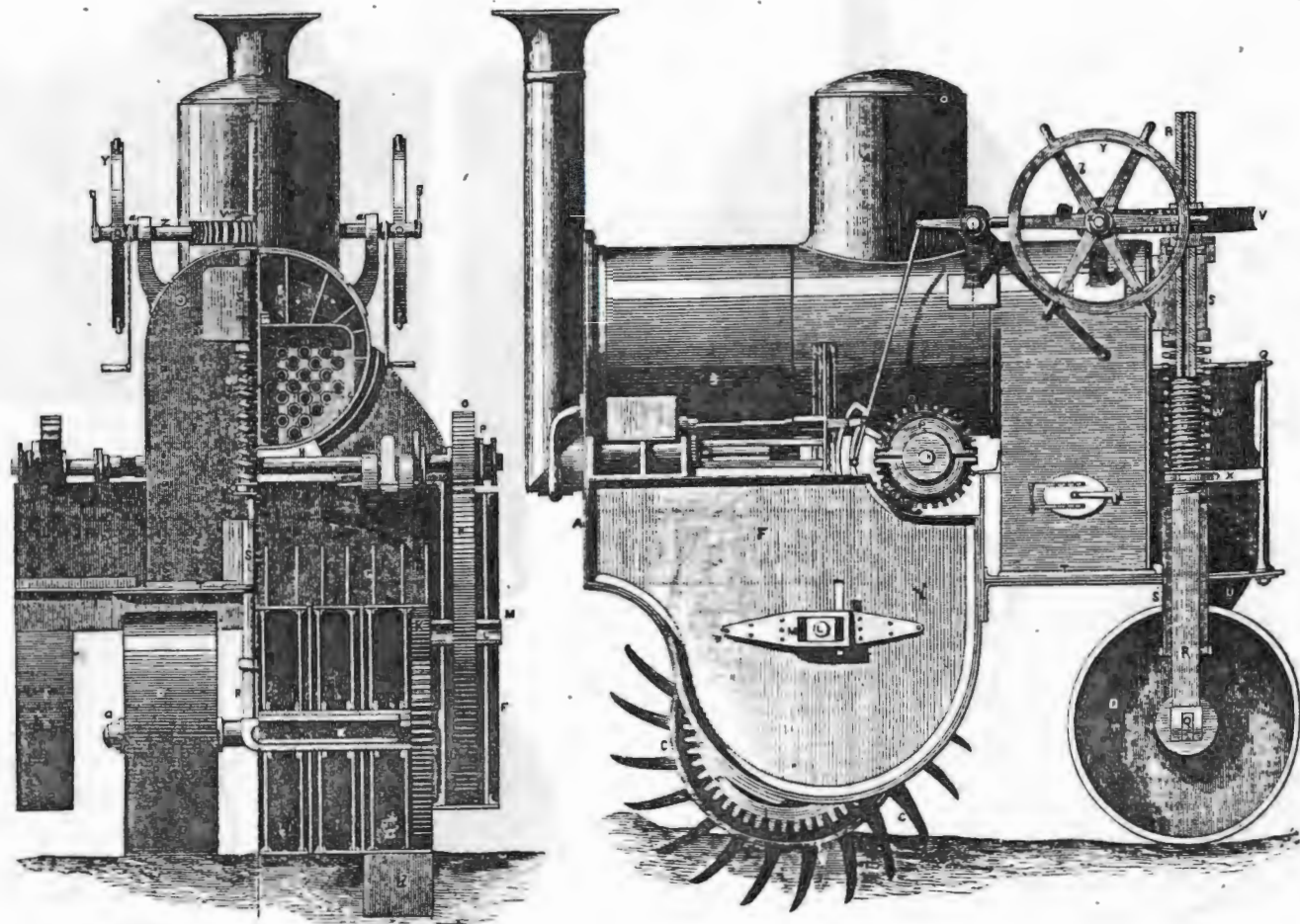
Notes : The subject was chosen as an interesting machine with an eccentric shape, expressively indicative of its agricultural function. Emphasis was on a process of reduction, based on an analysis of form rather than reference to mechanical function, incorporating volumetric forms as well as planes and lines.

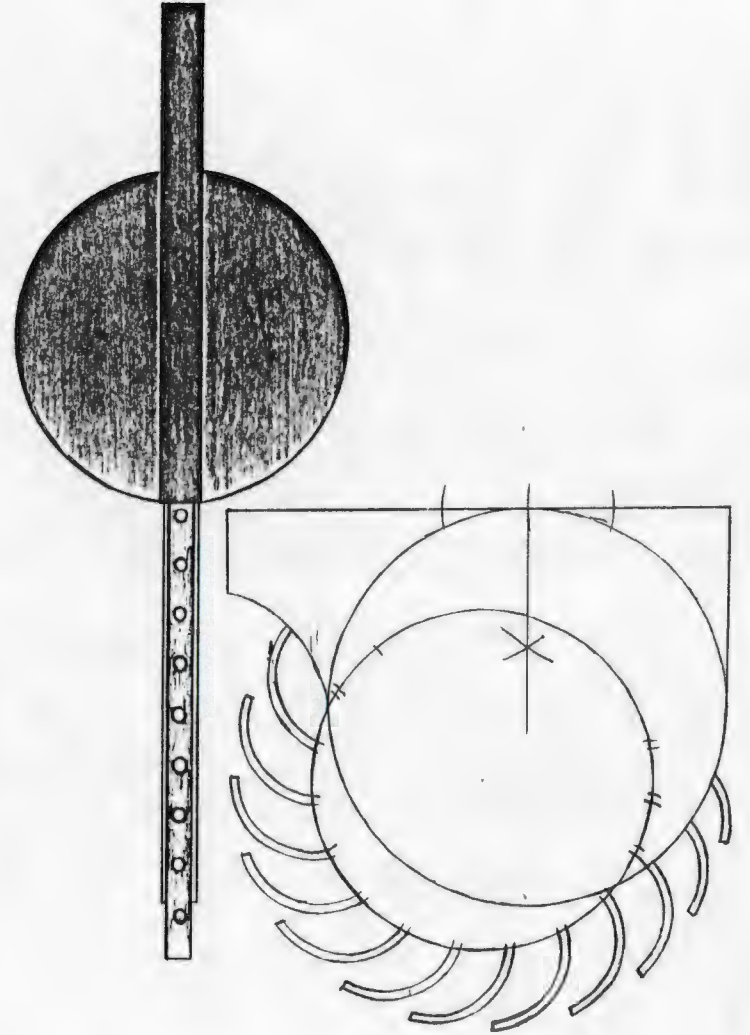
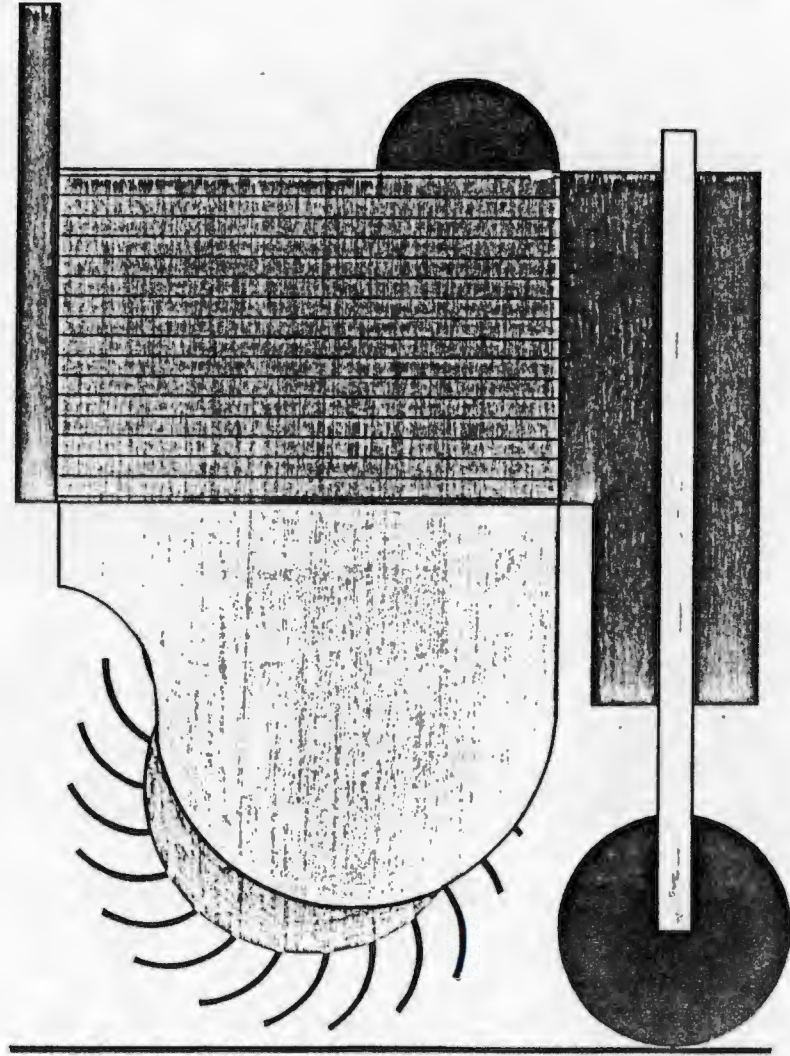
Elements were limited to those of aesthetic interest. Only two volumetric forms were retained - wheel and cylinder. The latter was 'fluted' in a similar manner to the cylinder of No.7 Beam Engine. Remaining elements were compressed into planar shapes of varying thicknesses. The yellow bars were shifted forward to the middle of the dark blue rectangular shapes, which were bent and rivetted to the main cylindrical form. The sculpture hung from the yellow bars, with three dowels slotted through bars, block, and planes, forming a compositional feature. The lilac plates holding the black tined wheel, were inserted into alternate slots in the cylinder. There was no hidden supportive structure, and all the elements were inter-supporting.

The source image showed the harrow as below ground, in order to break up the soil. In the sculpture, it was paradoxically raised and suspended above ground; similarly the sculpture stood on a single, small wheel, imparting a comical futility. Colour exceeded the previous range, there being a greater number of elements in the piece.

This sculpture resulted from a decision to break away from the representation of function, and to introduce the enigmatic. However, it retained structural and formal logic, and replaced structure with object. Technically, this was the most complex of my sculptures.









No.9 Crane 3

800 x 800 x 125 mm

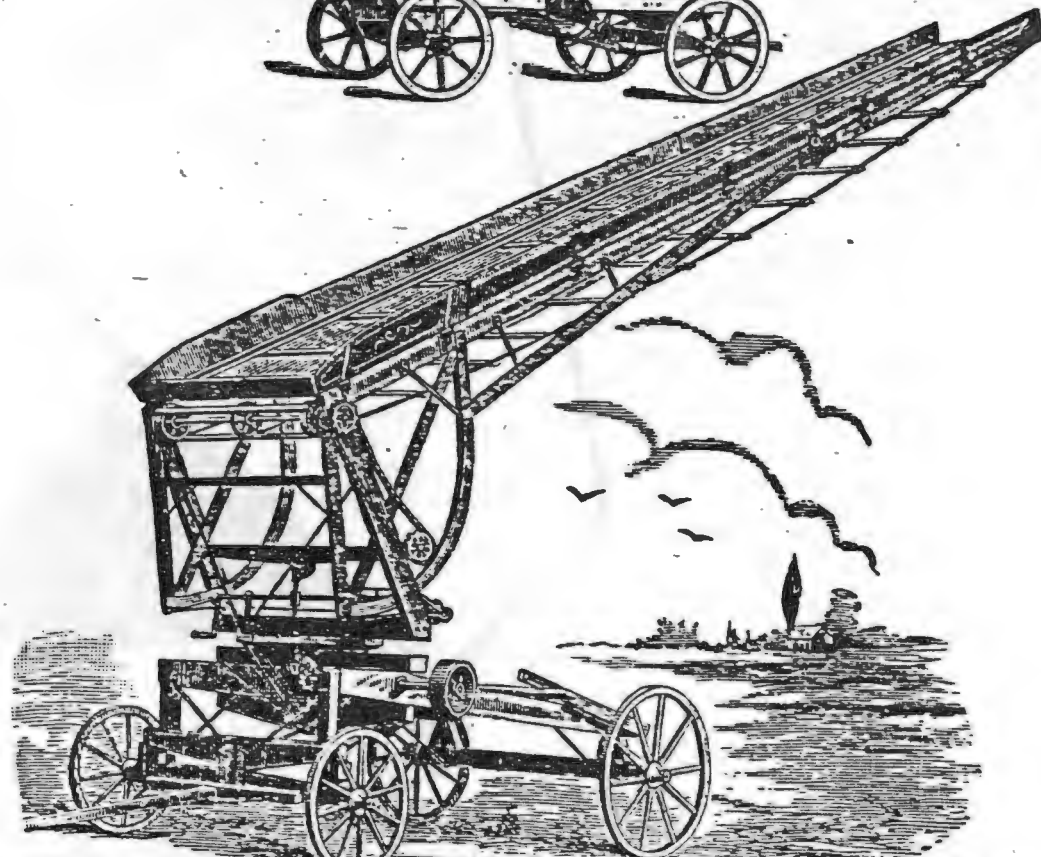
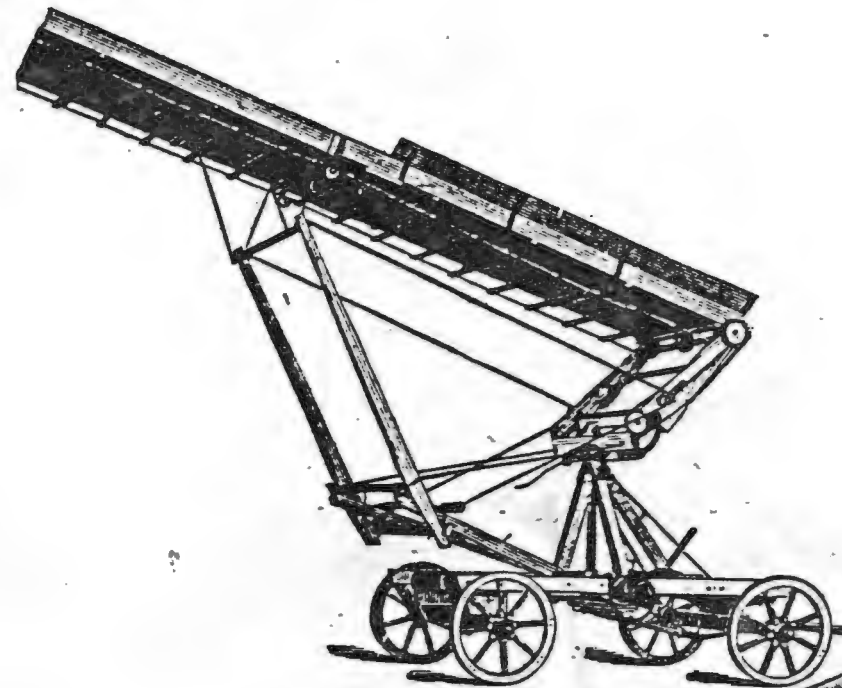
Aluminium sheet, rod; enamel paint.

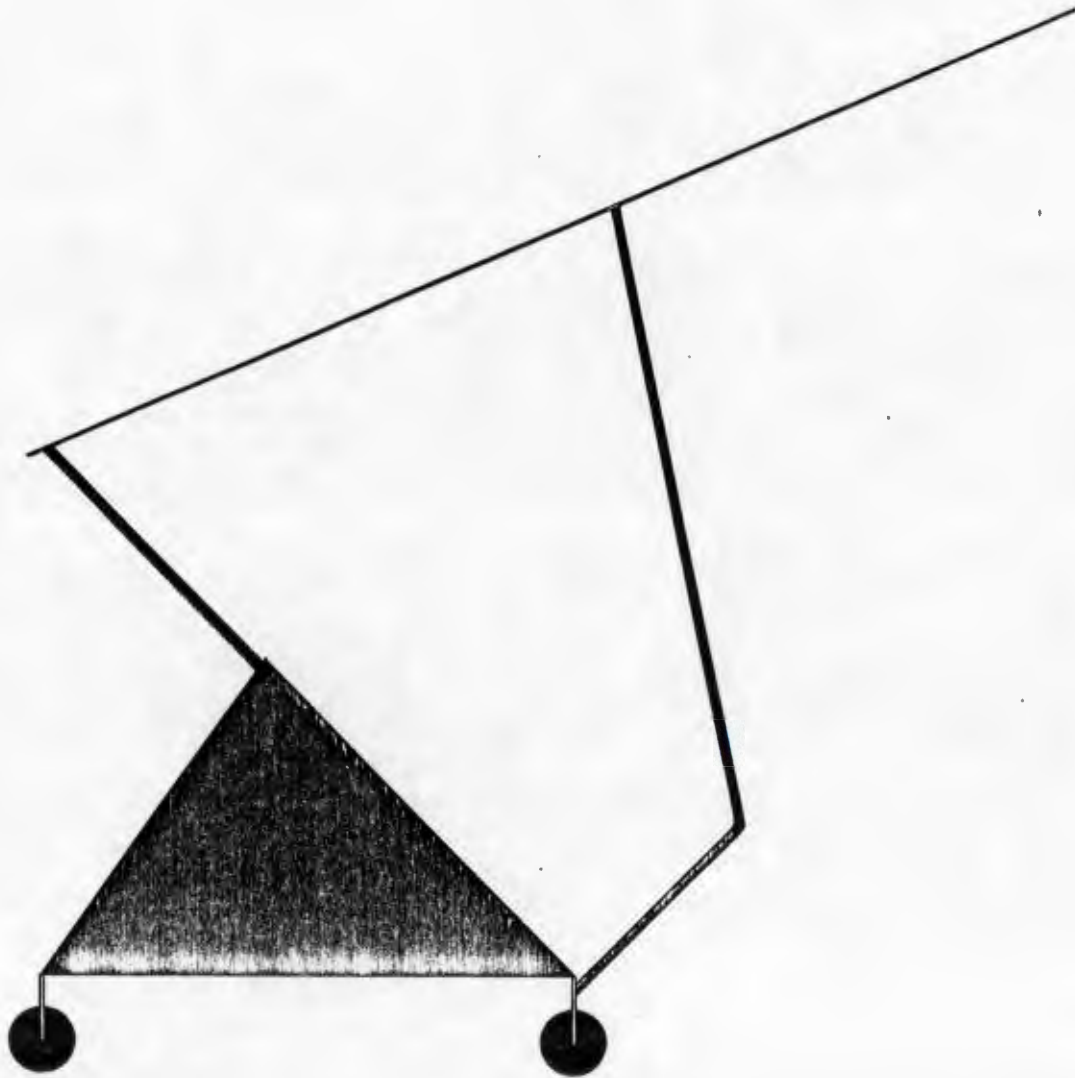
Source : Illustration of a crane. Johnson, P. Farm Inventions in the Making of America. Iowa : Wallace Homestead Book Company. (see illus. over)

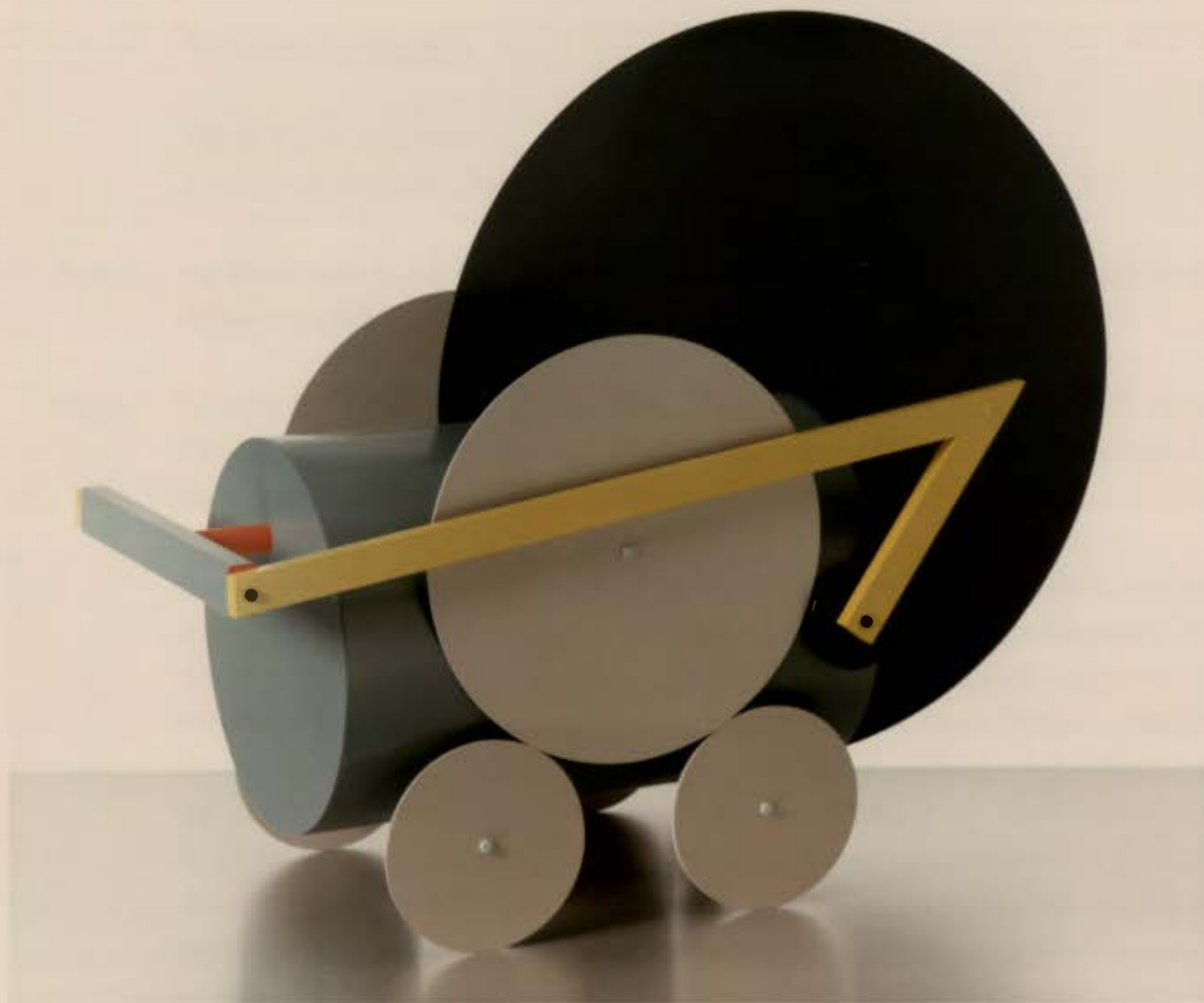
Notes : The image of the crane was chosen for the evocative quality of the dynamic thrust of the ladder into space, held by a disproportionately small undercarriage on wheels. The aim was to borrow key elements from this image in order to design a 'new object', without allusion to function.

Elements were reduced in number. The angles of the triangular base, and the angles at which the yellow and red rods carried the weight of the diagonal, were devised to exert tension and imply release. The sculpture was essentially a composition of planes and lines, sheet and rod being limited to the same thickness throughout. Joining was straightforward and expressed. The sculpture was visually weightless; the base was simply folded into an open shape. Wheels were slotted on. The midnight blue of the diagonal was introduced to the colour system for its intense, absorbent quality.

The limitation of materials was equivalent to limitations in drawing. There was no reference to function.







No.10 Penydaren Locomotive

590 x 735 x 315 mm

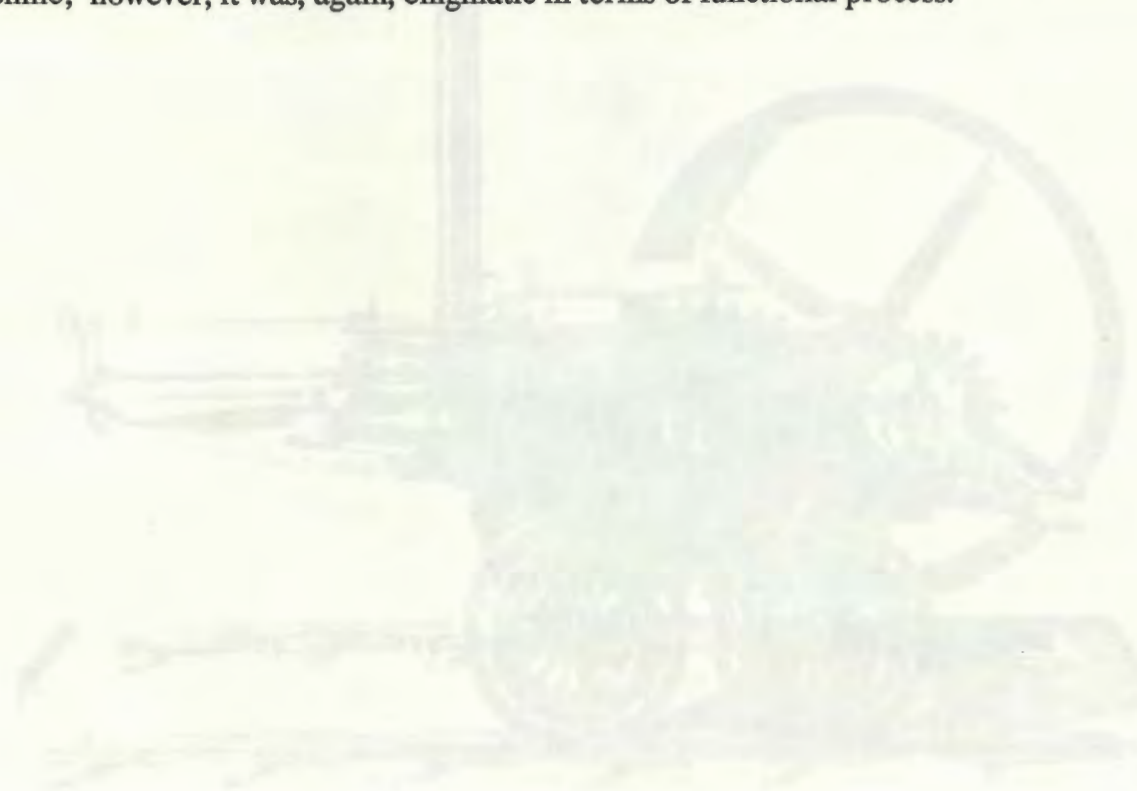
Aluminium sheet, rod, bar; mild steel; enamel paint.

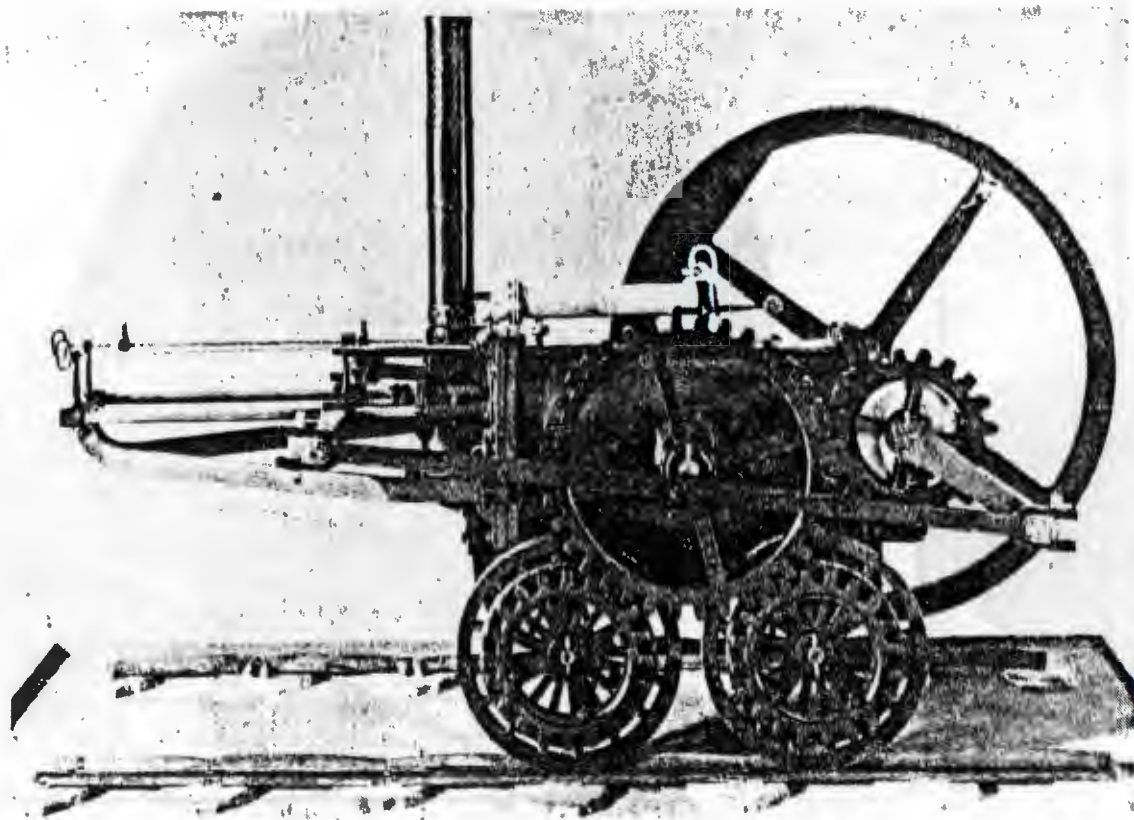
Source : An illustration of Trevithick's Penydaren locomotive of 1804. Hodge J. Richard Trevithick. Aylesbury : Shire Publications, 1984. p 25. (see illus. over)

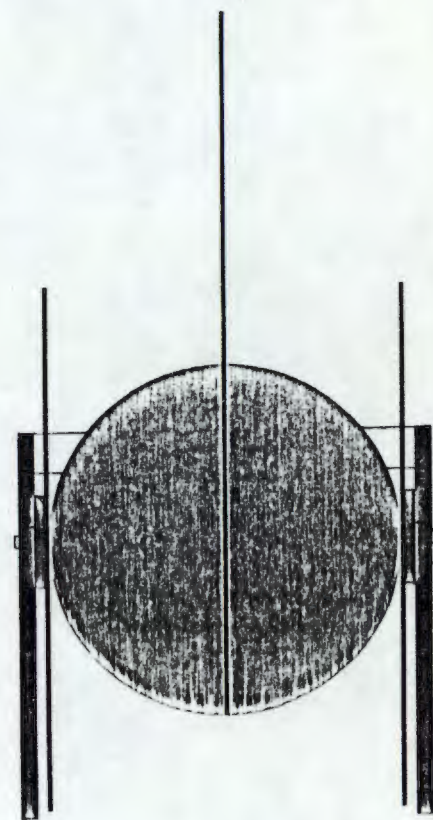
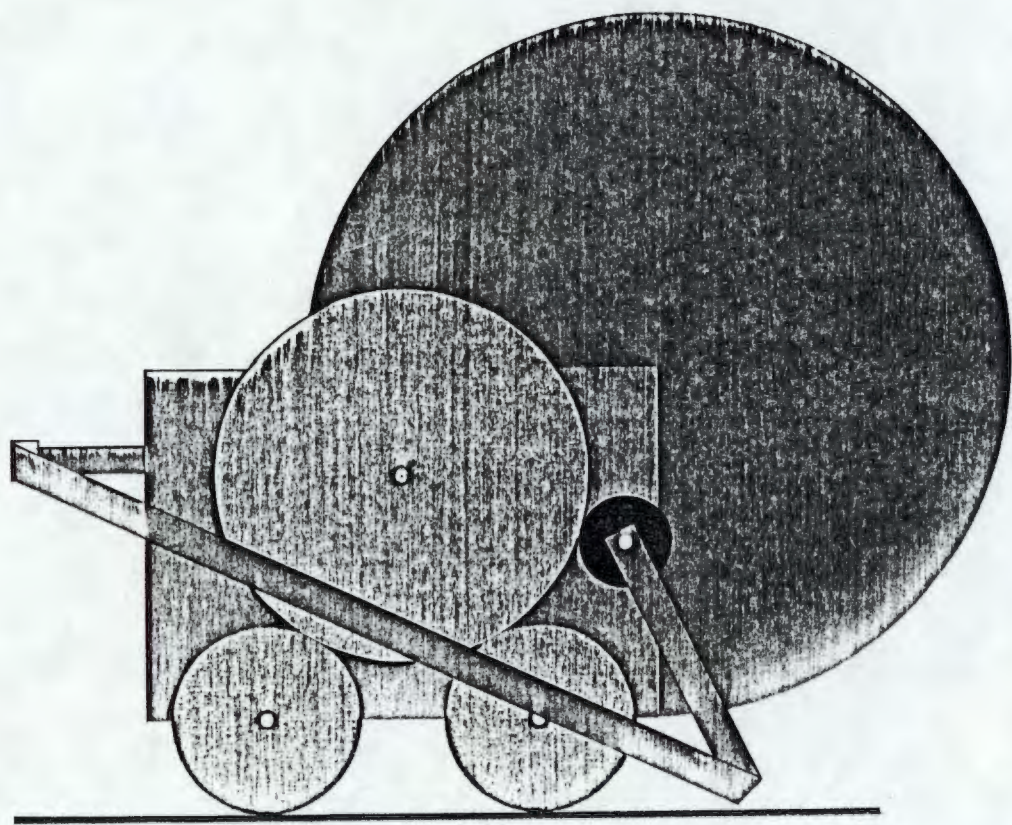
Notes : Interest was focused on the sets of wheels on either side of cylinder, and the mechanical 'legs'. The intention was to modify elements formally, resulting in an apparently logical machine-like object, which was essentially enigmatic.

In the source image, a large flywheel flanked one side of the boiler, and a flywheel, gearwheel, and third wheel flanked the other side. The flywheel was shifted to the centre of the cylinder to create a symmetry. In this way, the largest wheel no longer implied a mechanical function, becoming formally descriptive as well as an integral part of the piece, in that it physically slotted through the cylinder. The lighter grey circles became visually dynamic elements. Sculptural form was contracted, eliminating unnecessarily descriptive elements. Mechanical movement was frozen. Mechanical joints were simple : rods perforated the cylinder, circles were pinned into these and the pins were expressed. The colour system, apart from the yellow and red, was new. All machine elements were painted in dark, middle, and light grey tones as opposed to the primary yellow and red which still designated movement-related elements. This colour system was retained in the remaining works in the collection.

This sculpture confirmed the 'objecthood' which occurred in No.8 Cultivator 2, and was the first in a series of sculptures with linear and planar shapes composed around a cylindrical nucleus. By virtue of the formal vocabulary and method of construction, the object retained reference to the machine; however, it was, again, enigmatic in terms of functional process.









No.11 Road Locomotive 2

1000 x 506 x 300 mm

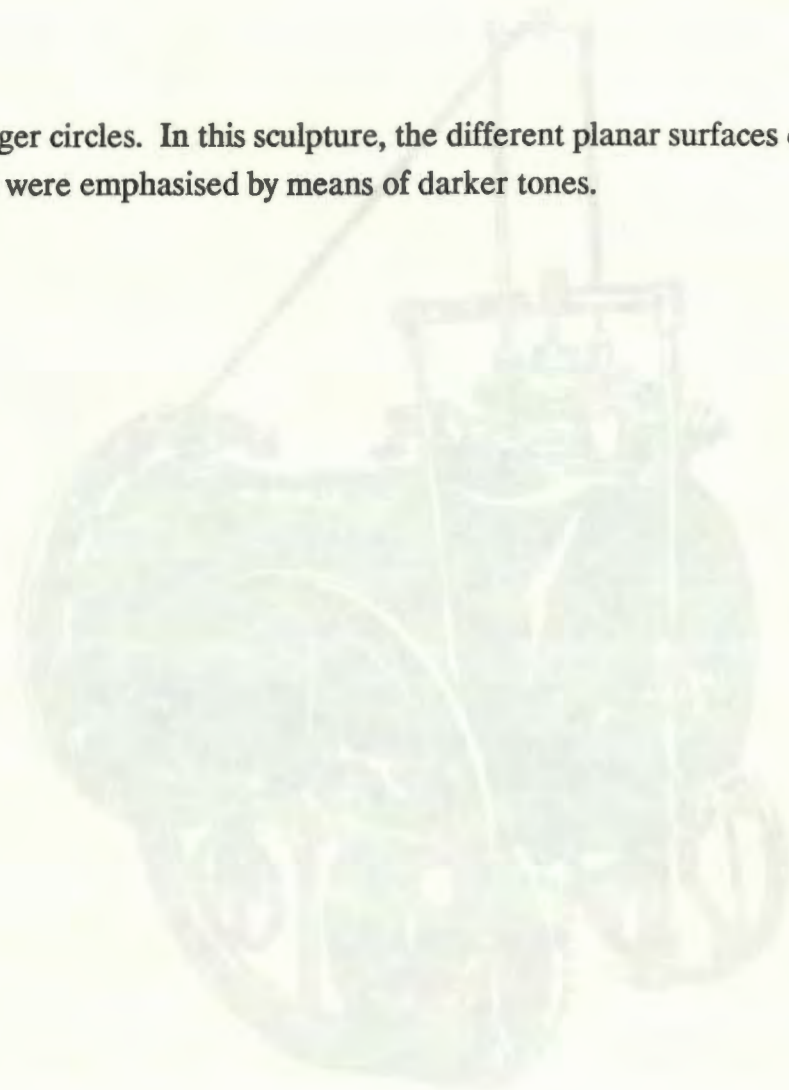
Aluminium sheet, rod, bar, plate; wood, mild steel sheet; enamel paint.

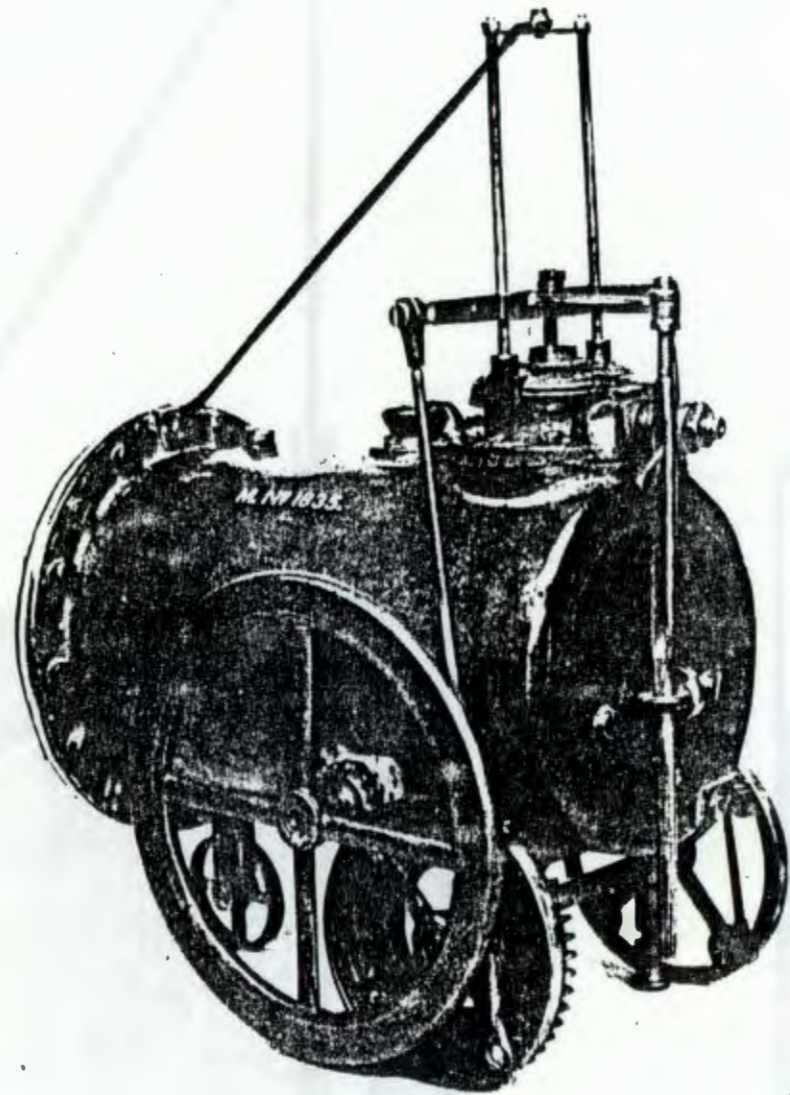
Source : An illustration of Trevithick's experimental model road locomotive, 1797-8. Hodge, J. Richard Trevithick. Aylesbury : Shire Publications, 1984. p 16. (see illus. over)

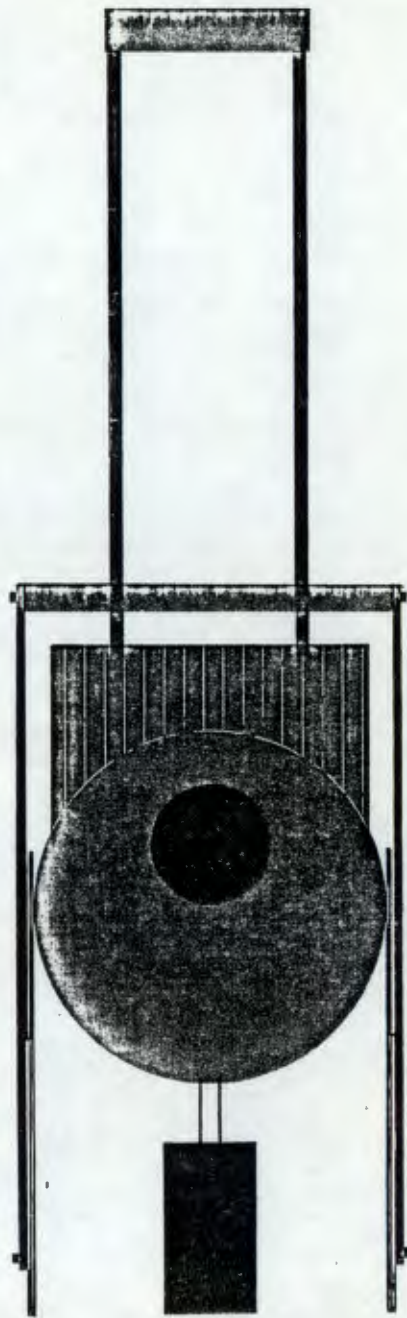
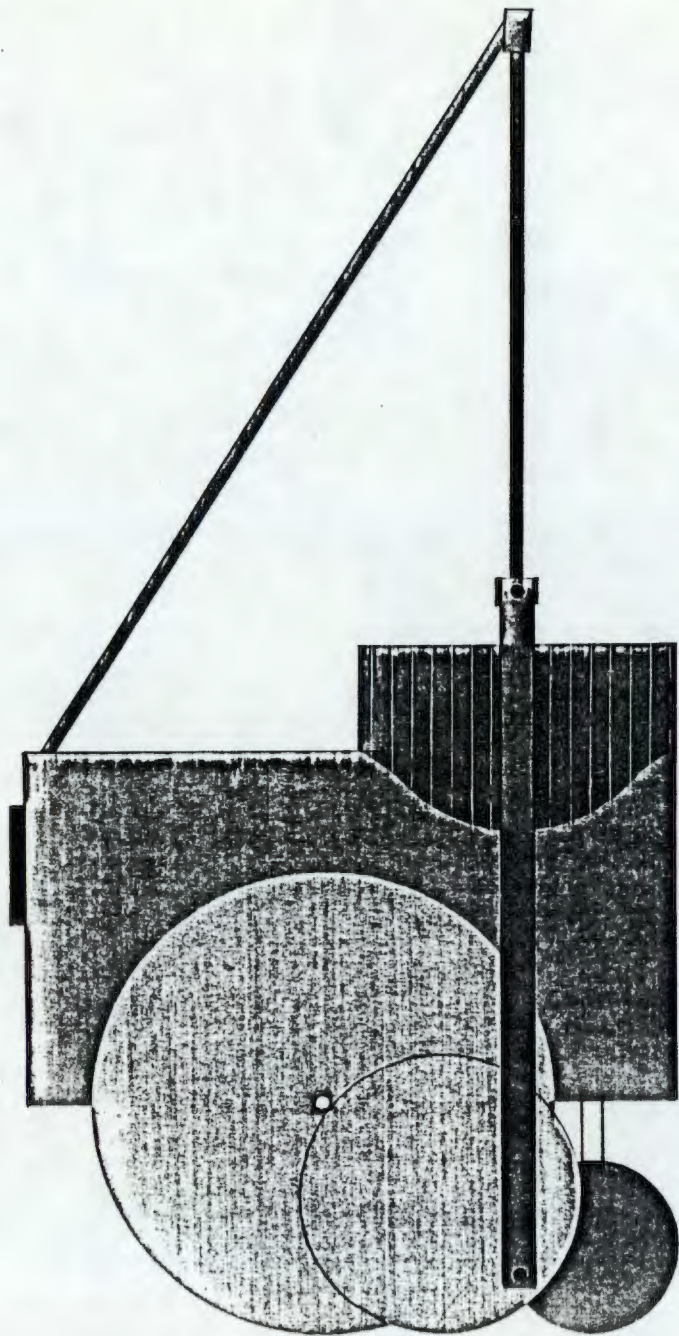
Notes : The intention was to reorganise and limit visual information, in order to create a new object, logical in itself.

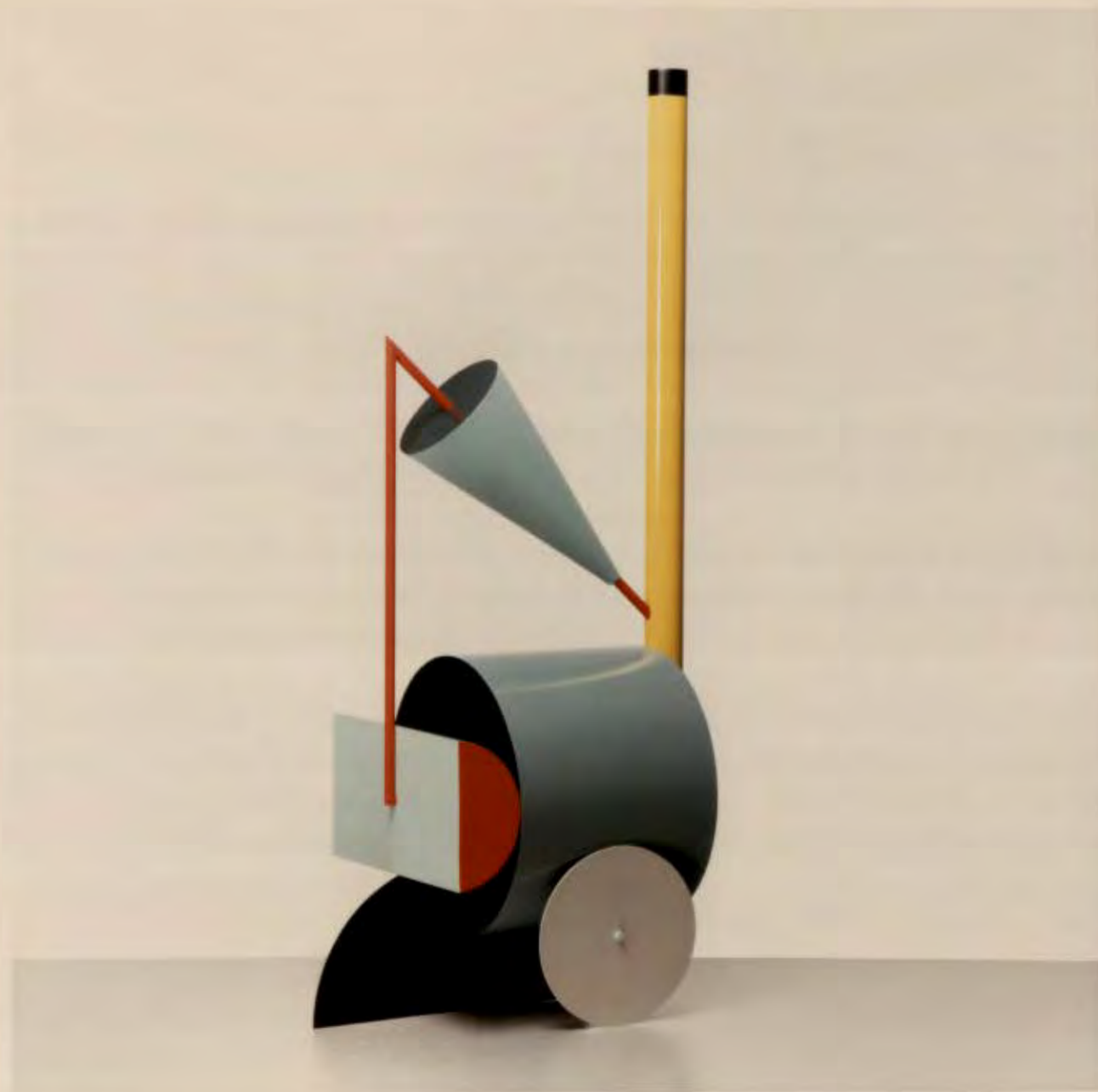
The relationships of elements to each other and to the cylinder were changed to suit the new image. The main cylinder and three sets of wheels were retained from the original subject; however the single, smaller wheel was shifted to the back and widened for structural and aesthetic reasons. The relative size of the boiler was diminished, increasing the importance of the larger wheels. Elimination of mechanical detail occurred to a greater extent : the most important functional element, the piston-rod, was excluded. The bar connecting the top of the slide bars had the same thickness and width as the crosshead, for compositional consistency. A smaller cylinder was introduced, cut to fit smoothly around the top of the curved surface of the main cylinder and running perpendicularly to it. Half-round rods were fixed to this cylinder, to increase the bulk. Slide bars rising out of this secondary cylinder were extended, resulting in a longer and steeper diagonal. Joining of elements was similar to the Penydaren piece (No.10), with large circles fixed to rods penetrating the cylinder. Smaller circles were attached to the

outside of the larger circles. In this sculpture, the different planar surfaces cutting through volumetric forms were emphasised by means of darker tones.









No.12 Road Locomotive 3

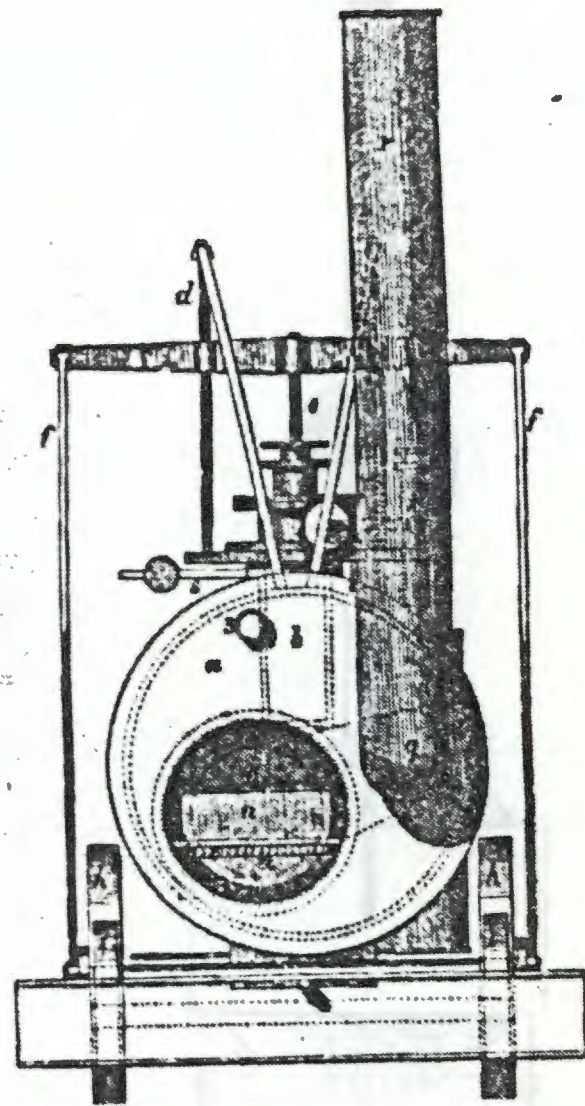
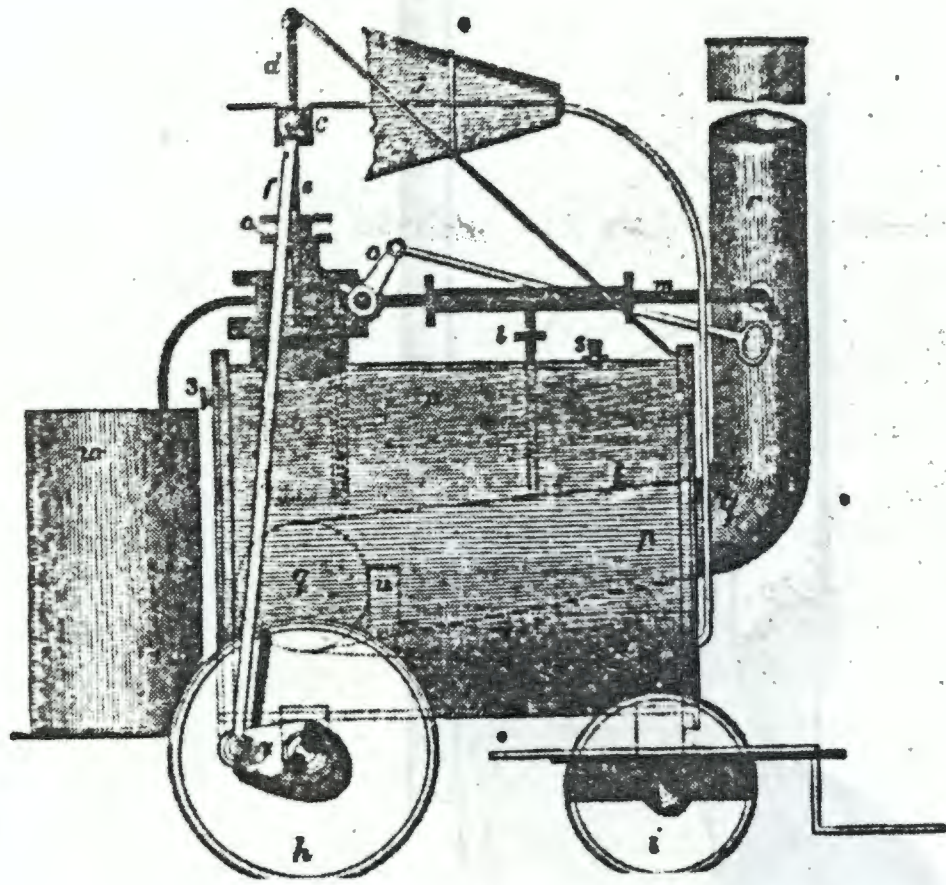
895 x 400 x 267 mm

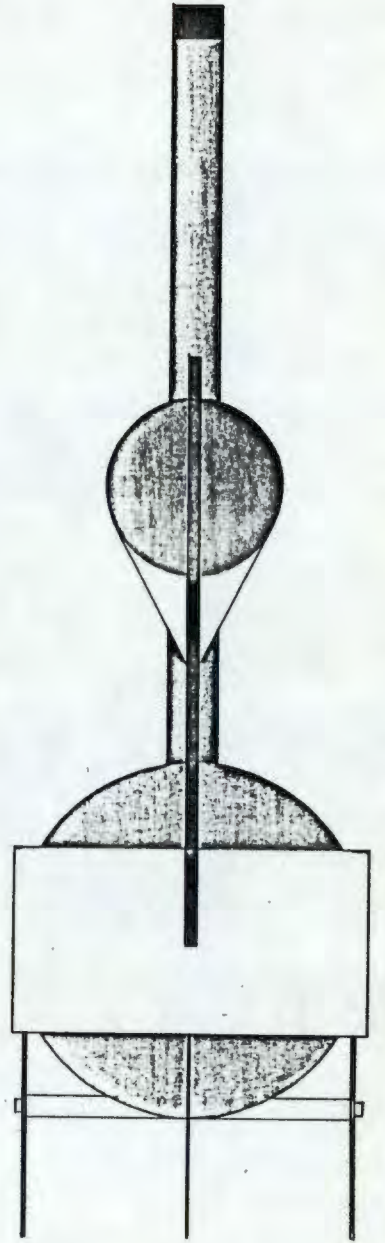
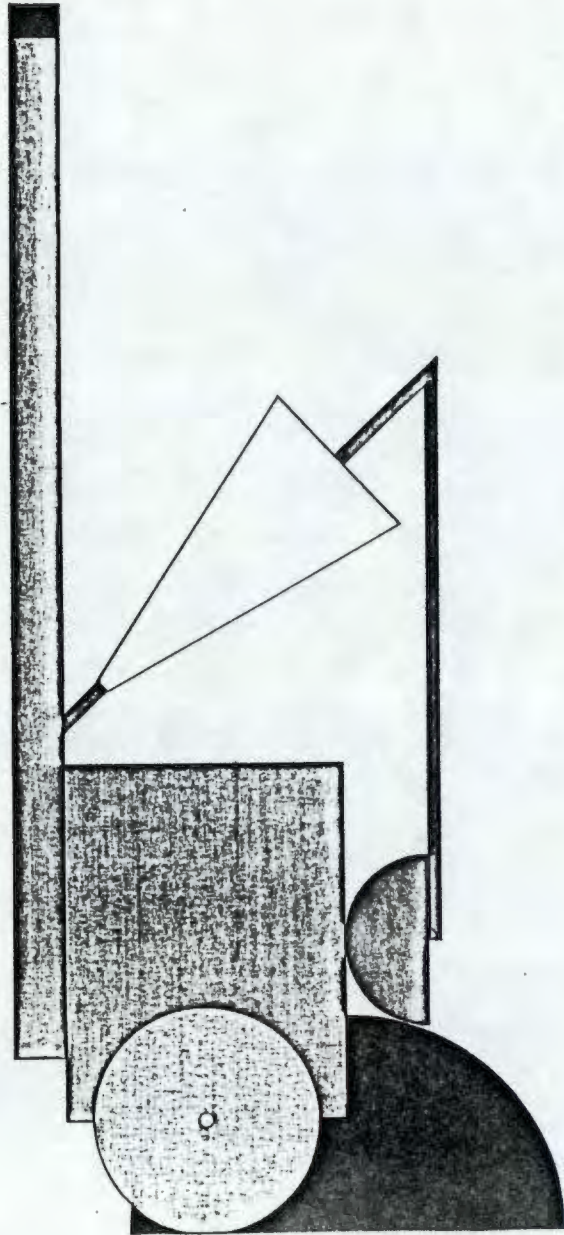
Aluminium sheet, rod, tube; mild steel; enamel paint.

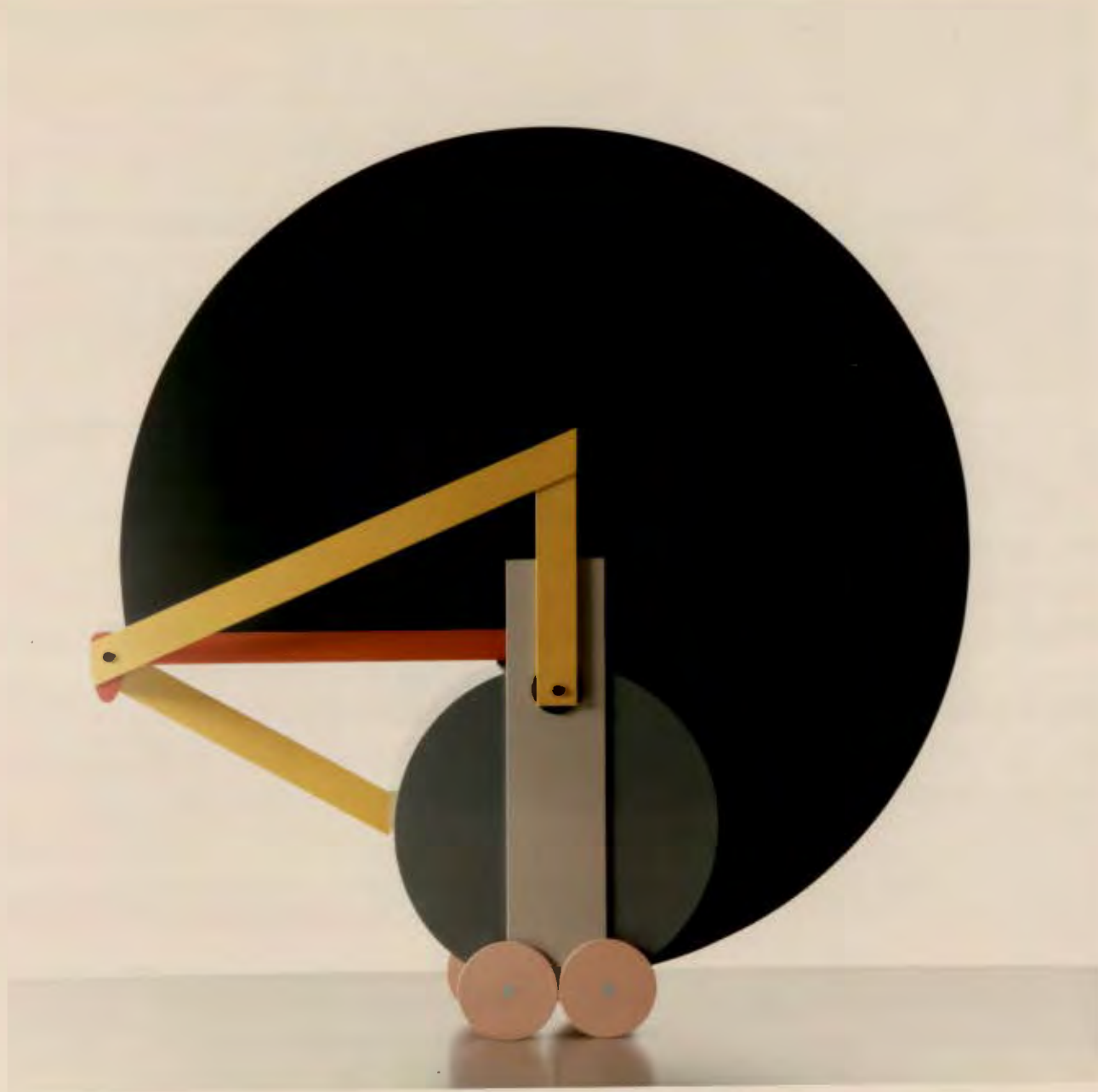
Source : An illustration of Trevithick's Camborne road locomotive, 1801. Hodge, J. Richard Trevithick. Aylesbury : Shire Publications, 1984. p 19. (see illus. over)

Notes : This subject was chosen for its secondary cylinder, and the 'frivolous' cone-shaped element suspended above it. A greater remove from the source was required, with a more innovative approach in the reduction of form.

The design of the original was radically simplified to include two cylinders, a chimney element, two wheels, a half-wheel, and a cone. The cylinder was compressed. The chimney was lengthened and the diameter reduced. The secondary cylinder was split lengthwise and inverted; the two back wheels were reduced to one, and halved. A red rod rose through the centre of the cone, bending at an acute angle to the centre of the half-cylinder. Colour followed the established system, with dark grey, light blue, and red defining the circular, semi-circular, and rectangular planes.







No.13 Synthesis 1

740 x 730 x 100 mm

Aluminium sheet, bar, rod; mild steel; enamel paint.

Source : Sculpture No.10, based on Trevithick's Penydaren Locomotive.

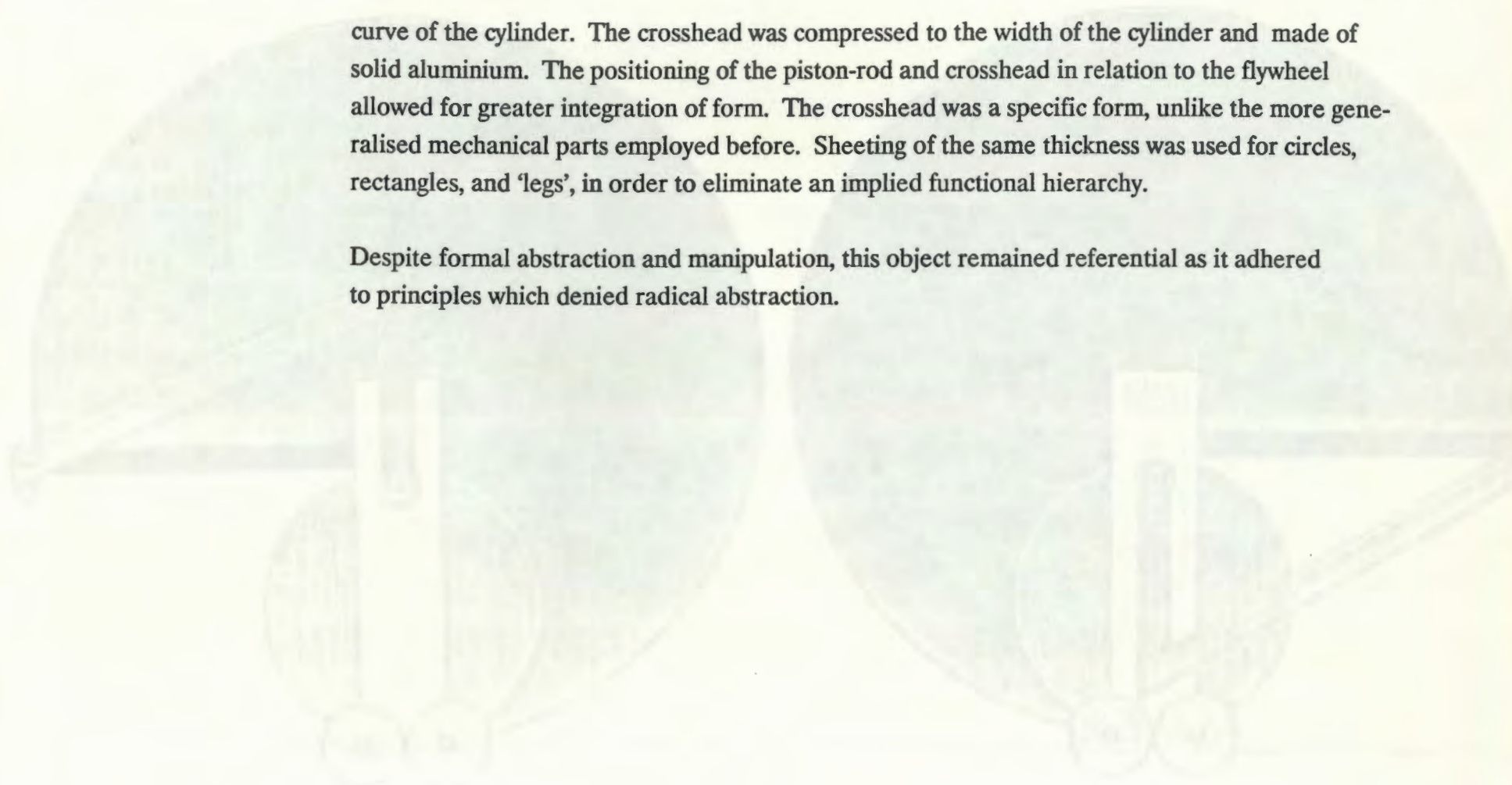
Notes : The last three sculptures were based on the series of locomotives (Nos.10,11,12). By taking as a starting point an already developed concept, establishing from the outset a greater distance from direct sources, the intention was to explore and apply a sculptural language in place of the established mechanical vocabulary. Since form follows function in the mechanical realm, the function inherently implied by a wheel, for example, is immediately grasped. By reducing a wheel to a flat disc, the sign assumes an extended meaning - the formal meaning of pure geometric form. By breaking away from functional scale, this formal emphasis was perpetuated. Objects were synthesised in the play of form, and became compressed mechanical symbols.

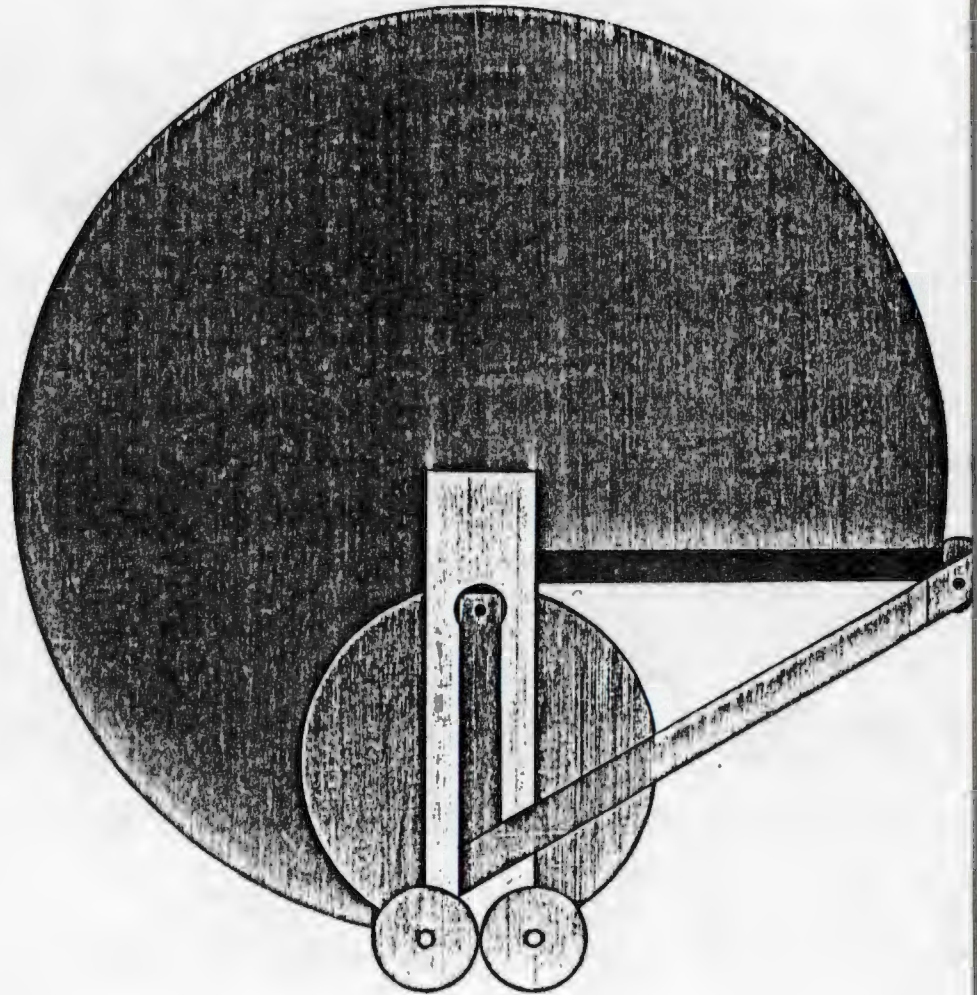
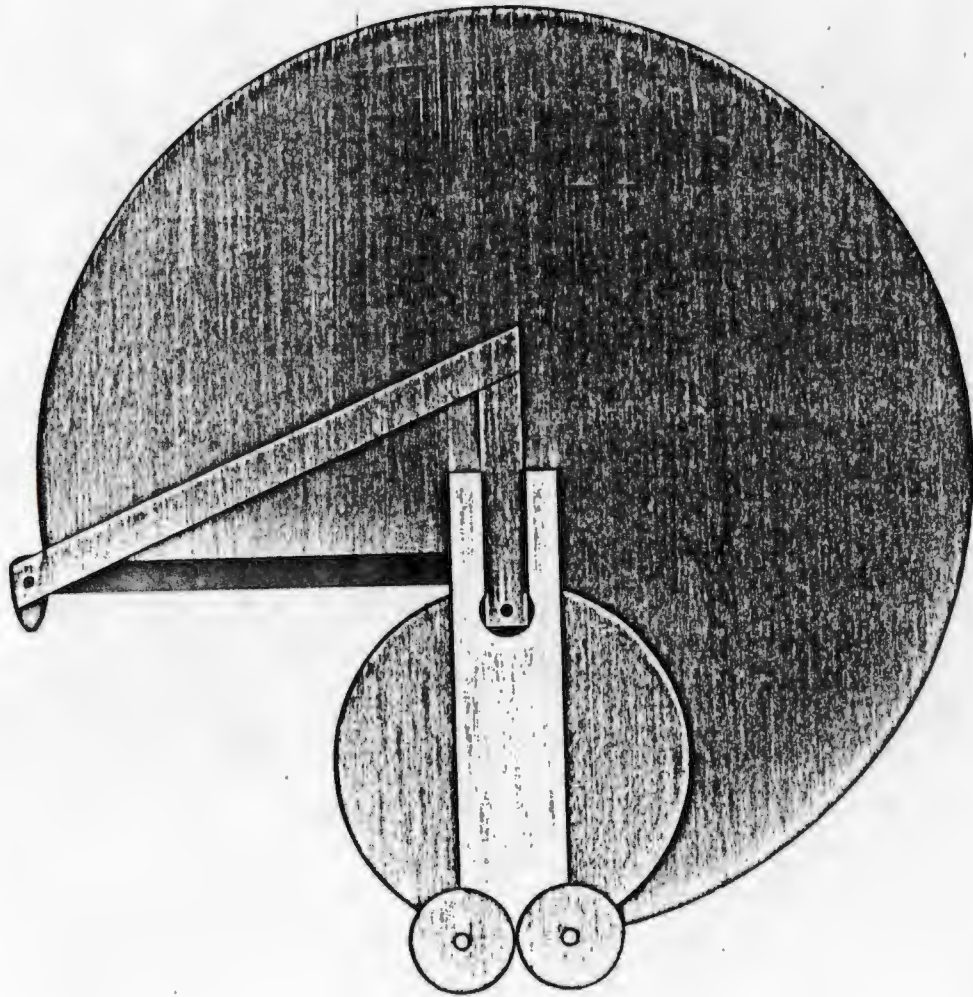
In No.13 the specific intention was to compress and flatten radically into an iconic image devoid of any functional implications.

The cylinder was compressed to a section of the original, and turned, resulting in a frontal view of what was originally a cross-section. The flywheel was enlarged. Smaller wheels were diminished, and the centre circle was replaced by a vertical rectangle. The smallest black wheel was transformed into the thin disc positioned on top of the rectangle. The flywheel was slotted along the

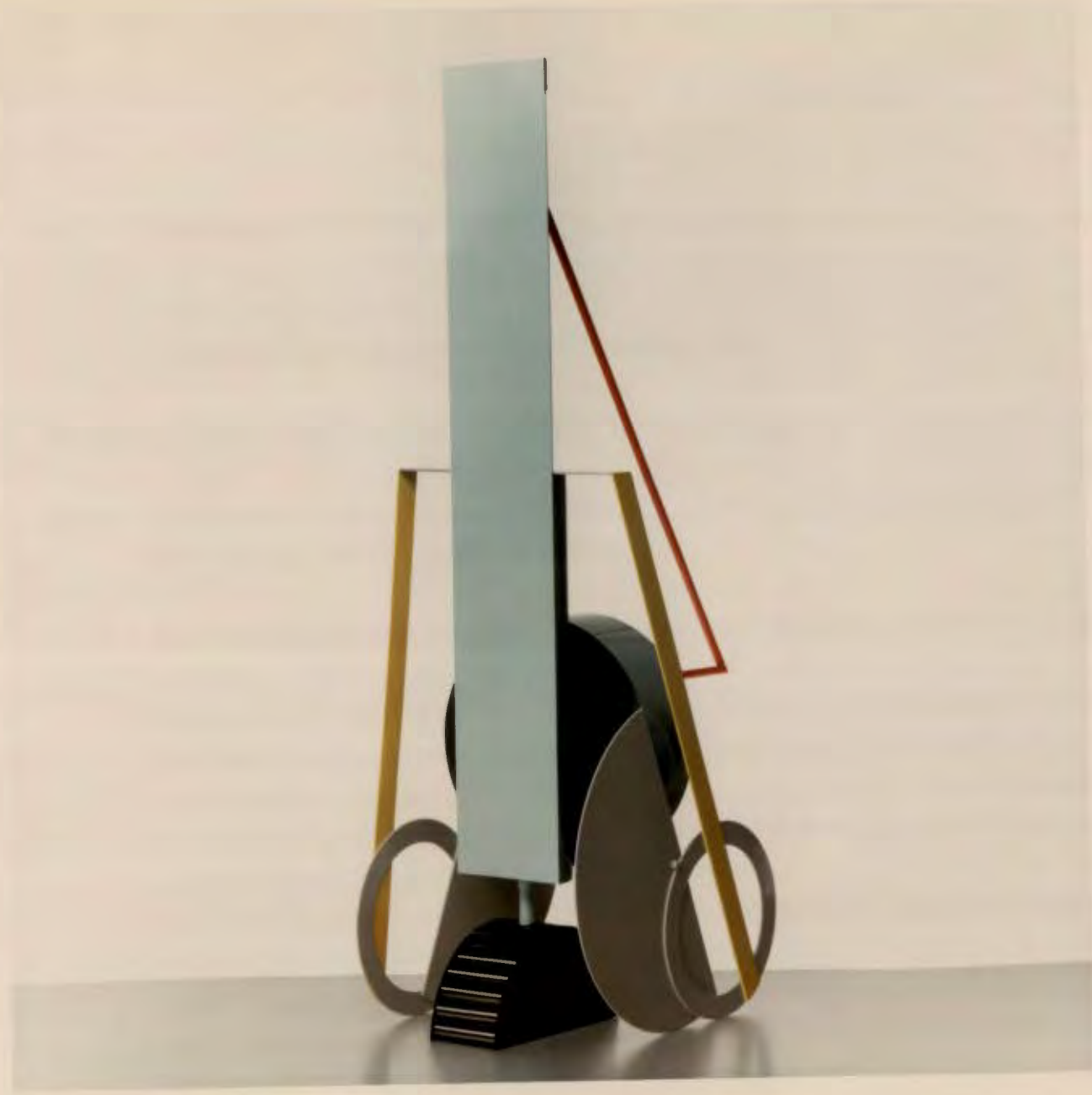
curve of the cylinder. The crosshead was compressed to the width of the cylinder and made of solid aluminium. The positioning of the piston-rod and crosshead in relation to the flywheel allowed for greater integration of form. The crosshead was a specific form, unlike the more generalised mechanical parts employed before. Sheet metal of the same thickness was used for circles, rectangles, and 'legs', in order to eliminate an implied functional hierarchy.

Despite formal abstraction and manipulation, this object remained referential as it adhered to principles which denied radical abstraction.









No.14 Synthesis 2

1050 x 500 x 280 mm

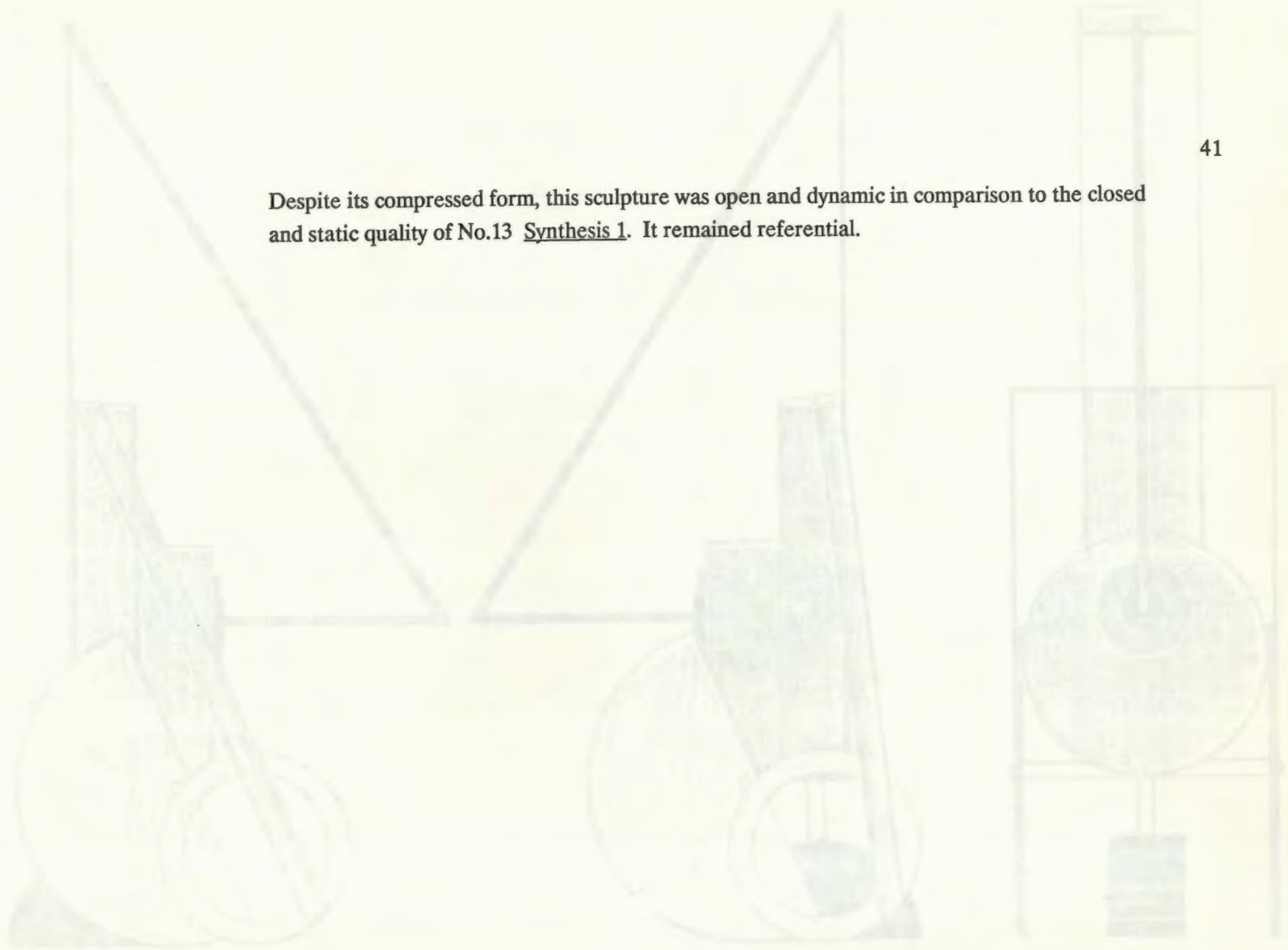
Aluminium sheet, rod, bar; mild steel; enamel paint.

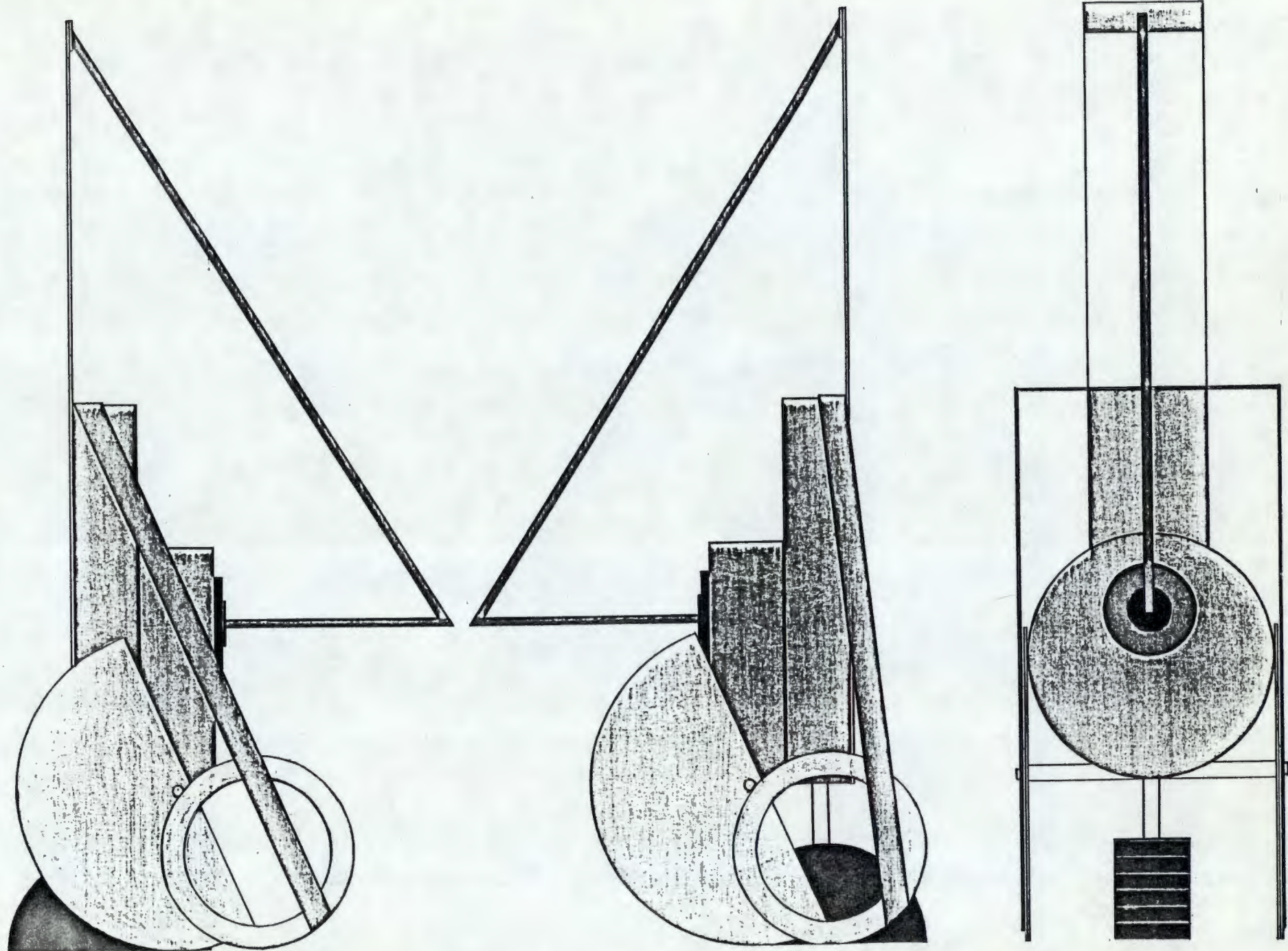
Source : Sculpture No.11, based on Trevithick's experimental model road locomotive.

Notes ; The intention was to 'explode' the form of the earlier sculpture, by breaking it up, inverting, compressing, flattening, and extending it.

The main cylinder was compressed to the same sectional width as that in No.13 Synthesis 1. The secondary cylinder was reduced in diameter, sliced in half, and lengthened. It was treated as a separate form, and rivetted from the inside onto the flat face of the cylinder. A long, flat sheet was pinned invisibly onto its rectangular face, extending beyond the length. This described the negative shape outlined by the slide bars in No.11 Locomotive 2. The diagonal extended beyond the cylinder, describing an angle in space, and was pinned onto a round disc in the centre of the cylindrical face. The single black wheel was enlarged, halved, and fluted. The bulk of the sculpture rested on this wheel. Larger wheels were cut in half, and arranged at a dynamic angle to the ground. Smaller circles became rings, invisibly pinned onto corresponding sides of the half-circles. The yellow bars followed continuous lines, the one moving forward to the ring to which it was pinned, the other moving perpendicularly to the ground and pinned to its corresponding ring. Pins were not expressed in order to avoid mechanical connotations. The crosshead was eliminated, becoming continuous with the 'legs'.

Despite its compressed form, this sculpture was open and dynamic in comparison to the closed and static quality of No.13 Synthesis 1. It remained referential.







No.15 Synthesis 3

640 x 835 x 120 mm

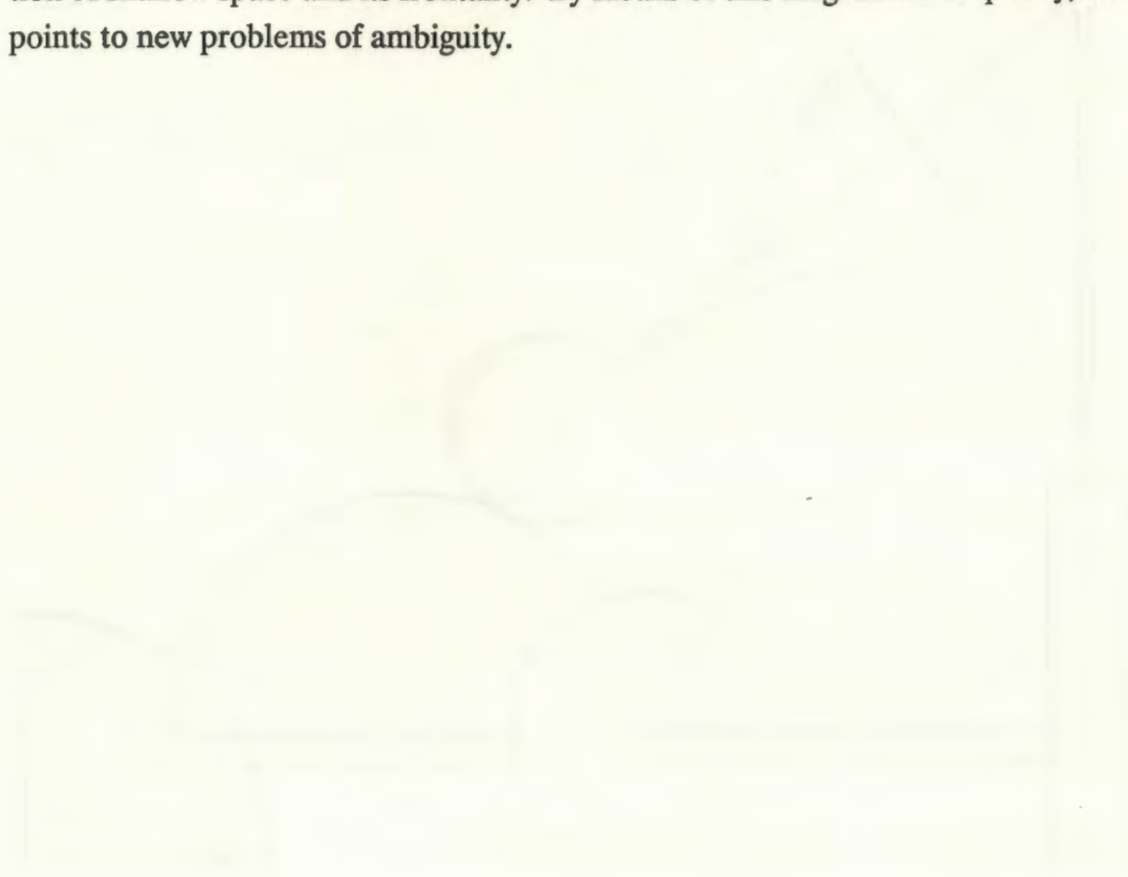
Aluminium sheet, rod, tube; mild steel, styrofoam, wood; enamel paint.

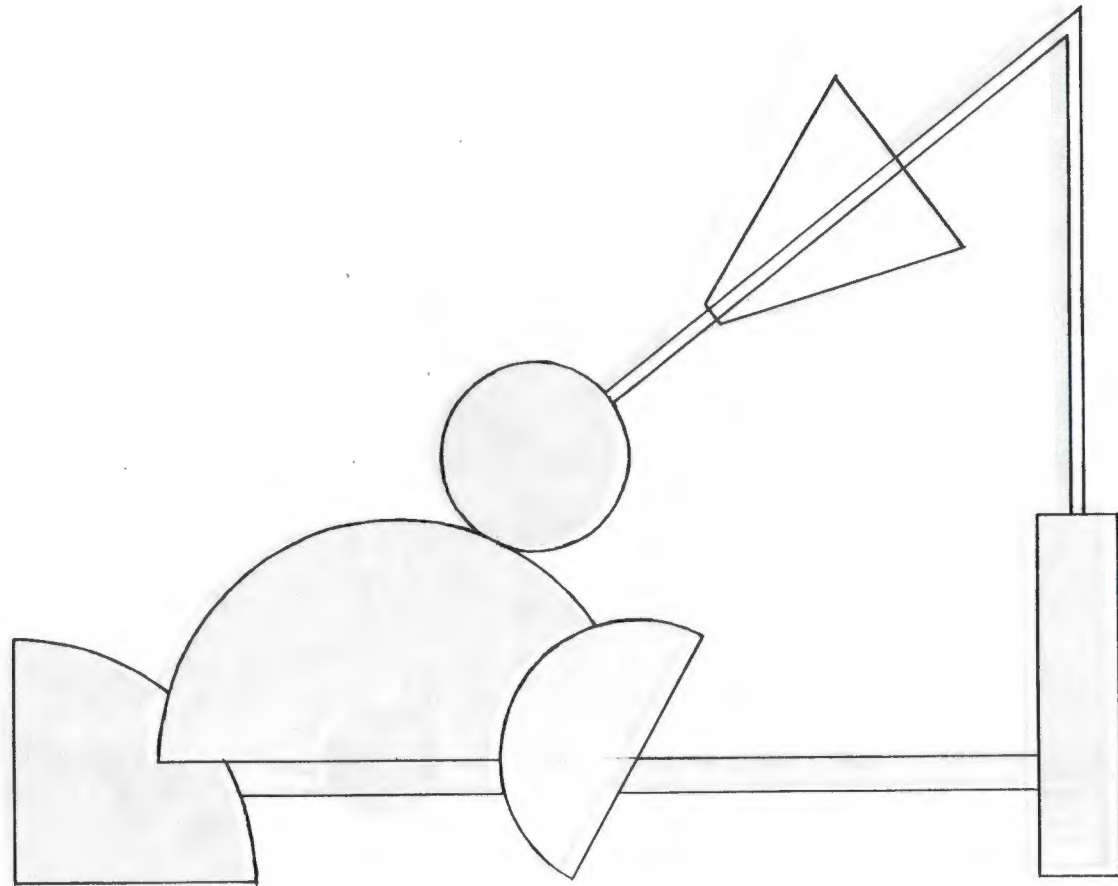
Source : Sculpture No.12, based on Trevithick's Camborne road locomotive.

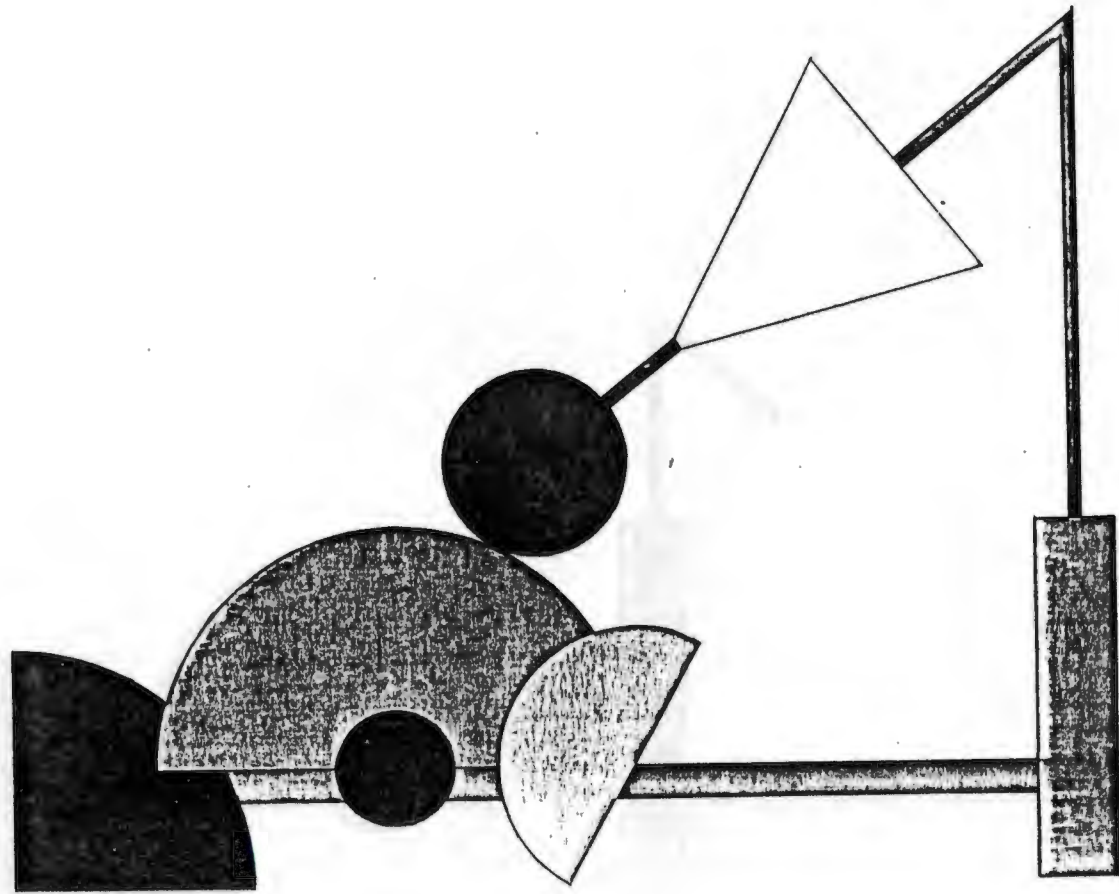
Notes : In this sculpture the concern was with the radical abstraction of the original's forms to pure form. The process of distancing elements from the original volumetric form, by using paper-thin elements, was extended by shifting parts into a horizontal compositional delineation, rejecting the cylindrical nucleus, and decontextualising parts. The decision to eliminate structural implications allowed for a rearrangement of forms in space in a manner comparable to that of painting on a flat surface, free from problems of structural logic.

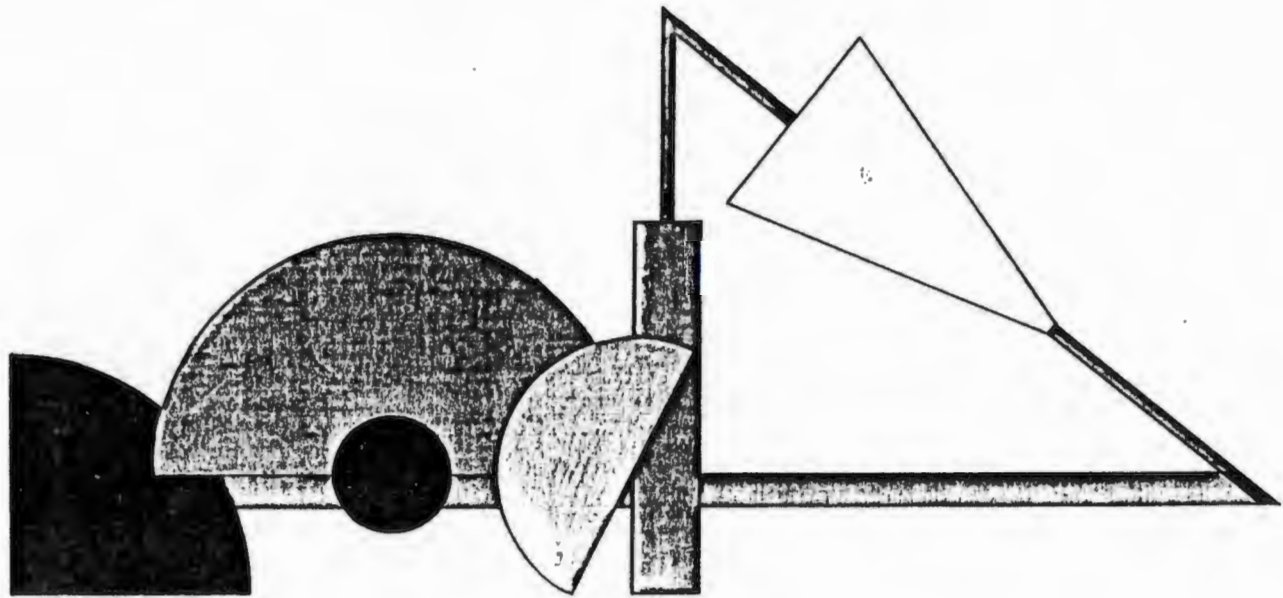
Elements were taken out of their logical order and rearranged horizontally. The main cylinder was cut in half; the chimney was cut in half lengthwise, and positioned parallel to the ground; the black circle was quartered, the small circles halved, and the cone was cut in half lengthwise. A disc of the same width as the half-cylinder was introduced, and rivetted from the inside. No joints were expressed. The smaller cylinder, halved lengthwise, stood apart from the nucleus of elements, but remained in line with it. Yellow and red rods visually bound elements together.

Despite volumetric elements, the sculpture was directionally two-dimensional, due to its occupation of shallow space and its frontality. By means of this diagrammatic quality, No.15 Synthesis 3 points to new problems of ambiguity.









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