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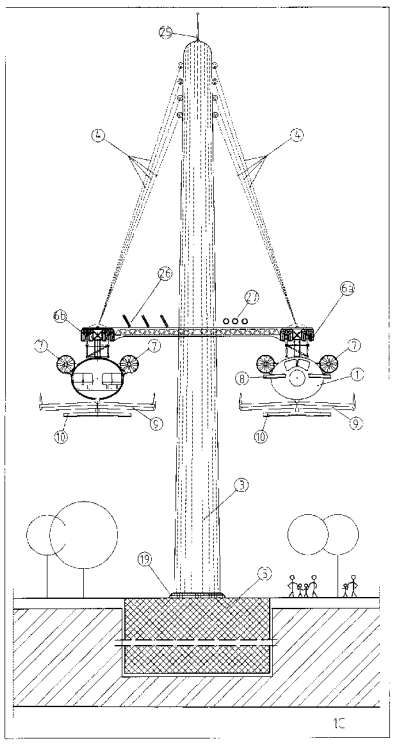
(54) Title: SYSTEM TRAIN AIR



(57) Abstract: The "system train air" is the invention of a suspended vehicle along a pair of rails (for each of the directions of rotation) high-speed traveling with the possibility of integrated territorial urban use both for people and for goods that achieves a new transport model. This transport system is composed as follows: cable-stayed bridges consist of masts (3), which support by means of tie rods (4) in high strength steel strands, a grid of stiffening (2) to which are anchored the tracks (6a) formed by C-shaped profiles semi-open downwards in each of which flows a special trolley (6b); the pair of carriages thus identified is connected to a pantograph which holds the carrier-fuselage aerodynamic shape. This carrier positively uses the "lift" that comes from its shape modeled on the aerodynamic optimization of the profile and staffing of a particular wing configuration (8,9,10).

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TITLE OF INVENTION: SYSTEM TRAIN AIR

DESCRIPTION

A) FIELD OF TECHNOLOGY TO WHICH INVENTION REFERS

The technical-scientific area to which the invention refers is "High Speed Train": that is, a carreir along the line defined by one or two tracks that can travel at speeds of over 300 km/h. This field involves a complexity of articulation and needs whose main technical-management criticalities are attributable to:

- aerodynamic, mechanical (friction) and physical (slopes of the track and tangential forces in increasing curve with speed) resistance;
- Disorders caused by the centripetal acceleration not compensated;
- Push of the carrier;
- Environmental impact;
- Integration with existing infrastructure;
- Interaction between the carrier and network committed to a coordinated system binary / cart;
- Cost of the network being set up and management;
- Overall positive rating to justify an economic and territorial significant technical effort.

Several proposals have been advanced so far in the reporting technology sector to address critical issues and meet the requirements listed above.

Then they will list some proposals that we considered more significant, but they provide only partial answers. The real issue that remains unresolved to date and which commits the present proposal is the prospect of a comprehensive response to these criticisms. This proposal is intended as a systemic response of the various components that are integrated into an innovative composition and assembly of parts.

B) STATE TECHNICAL EXISTING

The technology sector "high speed rail" (both the realization that research) has developed fundamentally in two directions:

1) Carriers that flow at high speed on rails;

2) carriers that proceed suspended from the rails.

The first is developed looking for solutions that can be summarized in four technological fields of research:

a) conventional high speed;

b) transrapid electromagnetic levitation;

c) vac-train;

d) French Aerotrain with air cushions.

o The first field of research (a) includes those that have been successful and application in various parts of the world, namely: the French TGV, German ICE, IC 2000 Swedes, Etr Franco-Italian, Japanese Shinkasen, Acela American, Spanish Talgo 350. This type of train needs new railway lines to reach high speeds but it fits with ordinary speed to traditional networks. Typically, the applied technologies improve the balance of the system with devices on trolleys and load distribution, creating, what is called, tilting of the center of gravity. The research covered the internal training of the vehicle allowing the oscillation of the case. The route of the railway network suffers a can't necessarily limited the rail track on the outside of the curve.

o The second field (b) comprises the "Transrapid" train by means of electromagnetic levitation suitable for both passenger and freight transport. Based on a patent of 1934, the projects of the Transrapid began in 1969. The test line, built on a path that runs about 8 meters above the ground, is located in Emsland in Germany and was completed in 1987. The Transrapid's linear synchronous engine is used to move the train and to stop it. It works with an electric rotary stator that was opened and lies along the rail. Inside of the alternating-current coils a magnetic field is generated, which moves the train without physical contact with the rail. This system has been tested for short periods in other circumstances without spreading, due to the high cost of construction and operation.

o The third field (c) called "Hyperloop" constitutes a recent research hypothesis developed in the USA. The project aims to realize a magnetic levitation train that will travel in a low pressure glass pipe, and hence in a low air resistance environment. A part of the cost of the magnetic levitation system, it is added to the complexity of building and maintaining a low-pressure glass system. Of course it must be assumed that instead the carrier will normally be pressurized to ensure the common survival being of the

travelers. The speed imagined to be reached should justify the condition of inaction to which travelers should agree to travel. The proposal, however fascinating, presents considerable negative effects.

o The fourth field (d) search is composed of "le chemin de fer suspendu Aerotrain Frangais", which has realized only as a prototype. It is constituted by a vehicle that runs along a track "T" upside-suspended by jets of compressed air. The push to the movement is provided by a propeller system set up on top of the cowling.

The research fields listed address the issue of the resistance of the wheels and air from the advancing of a rail carrier. These solutions solve the specific problem, but introduce others in blow up the costs of construction and management that prevent a mass production.

The second direction had a mainly academic development and it is present in some industrial patents. Many proposals did not reach the production phase due to lack of systematic shortcomings and incompatibility with existing networks, requiring substantial initial investments, also unprofitable.

As an example, it is presented a list of 18 significant patents which address the issue of high-speed rail only partially suspended proposing various solutions comparable with the present proposal (S.T.A.):

1. PATENT N ° US 1,422,394 July 11, 1922 "SUSPENDED HIGH SPEED RAILWY" R.Wagner

2. PATENT N ° US 1798852A March 31.1931 "SINGLE RAIL RAILWAY" Th. Roghmanns

3. PATENT N ° US 2,503,120 in August, 7.1947 "HIGH-SPEED RAIL VEHICLE" R.Meyer

4. PATENT N ° US 2864318A December 16.1958 "METHOD AND APPARATUS FOR RAIL TRANSPORTATION" H.A. Toulmin, Jr.

5. PATENT N ° US 3444823A May 20.1969 "SUSPENDED WHEELED VEHICLE HAVING Auxilliary AIR CUSHION AND RUNNING GEAR AIRFOL CAkmentin

6. PATENT N ° US 3457876A July 29.1869 "SUSPENDED RAILWAY SYSTEM" W.D.Holden

7. PATENT N ° US 4,102,272 July 25.1978 "TRANSPORT SYSTEM HIGH SPEED" E.L.Lehl, G.W.Zumwalt

8. PATENT N ° US 4,703,697 November 3,1987 "TRANSPORTATION SYSTEM" G.S.Bell,

9. PATENT N ° 5170715 December 15.1992 "aeromagnetic MAGLEV CONTROL OF VEHICLES WITH TURNTABLE HINGED MOUNTED CONTROL SURFACE HAVING TWO DEGREES MOTION" R.J.Gran

10. PATENT N ° IT 5168A89 October 21.1992 "SUSPENSION VEHICLE ALONG A HIGH SPEED RAIL CREWS 'CBoffa

11. PATENT N ° N ° US 5535963A July 16, 1996 "TRANSPORTATION SYSTEM Employing AIRCRAFT GUIDED BY RAIL" E.L.Lehl, G.W.Zumwalt

12. PATENT N ° 5909710 in June, 8.1999 "AIR-levitated TRAIN" r.d.c UMMINS

13. PATENT N ° CN 1225320A August 11.1999 "HUNG TRAIN WITH AIR POWER" Xiemei Hong

14. PATENT N ° US 7124692B "in October, 24.2006" OVERHEAD SUSPENDED TRANSPORTATION SYSTEM AND METOD "K. Guenther, Sergeant Wilfred

15. PATENT N ° CN 101112898A January 30,2008 "ALA SUSPENSION SUPER SPEED LIGHT POWER" Peng Jiancheng

16. PATENT N ° US 8015925B2 September 13,2011 "AIR BUS TRANSPORTATION SYSTEM" Abner J. Simon

17. PATENT N ° CN 102 951 166 March, 6.2013 "HIGH-SPEED BASED RAILWAIY AERODYNAMIC Aerotrain SIMULATED WITH WINGS ON A CHASSIS OF BODY Aerotrain Jiang Lei, J.Liu Liu, Ma Yang,

18. PATENT N ° CN 103332194A October 2.2013 "A TYPE OF UNITS 'HUNG MONORAIL" W.Boming, T. A, C.Kai, Zh. Dry

All proposals warn the complexity of the technical sector and devise solutions that address the inherent weaknesses. All the proposed solutions are an interesting background of hypotheses but do not reach a satisfactory level overall optimization.

C) DISCLOSURE OF INVENTION

CI. THE TECHNICAL PROBLEM

In summary, we are facing to a transport system that should integrate and combine the positive characteristics of train and plane. From the train, one wants to adopt the principle of tracks, instead from the aircraft one wants to exploit the idea to create a situation with nearly-zero friction to sliding off the rails. This solution can maximize the positive aspects of the two transport systems and overcome the problems listed above.

The desired solution, however, must simultaneously combine some requirements that make it competitive and viable patent. It was searched for an invention in which at the technical answers was also integrated a solution with the following features:

• cost efficient (in the comparative sense) in both the construction and management phases;

• intrinsically safe and stable compared to lateral forces, risks breakage of engines and plants, resistant to transverse oscillations;

• comfortable while traveling and for easy access to the cities and integration with other infrastructure networks;

• adaptable to the territory and populated areas;

• low environmental impact for a high-speed transport for hearing levels, soil consumption, energy consumption and disturbance to the territory crossed;

• self-sufficient in energy prices;

• capable of creating availability of artificial territory resulting from the construction of the grid. The top of the grid becomes a "floor" able to support intubated connections between destinations associates and installations of renewable energy production to serve primarily on the carrier's propulsion.

C2. THE PROPOSED SOLUTION

"STA" is a carrier that slides along a pair of rails by exploiting the lift of the wing loading. The vehicle has a particular aerodynamic configuration and a wing apparatus, from the drawing, and amplitude such as to produce a lift equal to the weight of the laden carrier. In this way, when the cruise speed is reached, the carriages allow a safe sliding without producing significant friction. Within each carriage hangs a rod joined to a pantograph composed of several elements with interposed shock absorbers such as to enable the management of the transverse oscillations. This technological peculiarity allows and ensures the "control" of centrifugal acceleration and any lateral thrust in straight sections resulting from gusts of wind. Such characteristics of the system also integrates the contribution of the forces generated by the wing surfaces. The balance of the whole is managed by specific digital control equipment. The suspended vehicle, then, flows on a pair of rails which in turn are coupled to a horizontal grid which helps the transverse and vertical stiffening of the tracks. This network is suspended and supported by cable-stayed bridges where the pylons are implanted at a variable distance from each other. The distance depends on the terrain, obstacles encountered and the structural calculation. The grid can be adapted to support photovoltaic panels, wind turbines and ducts. The pair of rails are running at a variable height above ground level, in order to make the system independent from the existing infrastructure network. At railway stations, bus and coach and / or places of cars stop, the system connects with vertical connections made of escalators and elevators. The adaptability to the hilly terrain and the existing infrastructure makes the system highly dynamic, functional and economical. The total independence from existing rail system ensures the automated management in advanced stage. It is assumed the creation of a computerized management system of individual demand through the development of specific algorithm. The goal is to create a system for advanced dynamic management organized and managed on the basis of the application.

D) DESCRIPTION ANALYTICAL DRAWING

We describe analytically the parts with reference to the accompanying drawings. These refer to the network (1A / B / C), the carrier (2A / B / C / D), the binary system / carriage (3A / B / C / D).

NETWORK (drawings TAVV.1A / B / C).

The network, carrier of the transport system, is constituted by a pair of rails (6a) (in each direction) hooked to a horizontal transverse stiffener of the grid (2). This system is suspended and supported by cable-stayed bridges where the pylons (3) are implanted at a variable distance from each other, as previously described.

The rails (6a) are C-shape downwards, within which slide, in safety and negligible friction, the support of the carrier trolleys.

The bridge rigging is done with rods in high strength steel strands.

The loads and the tensions of such a structural system, for the purposes of verification and static fatigue are negligible and do not present complications of calculation and of particular realization with respect to the kind of bridges of interest.

The support poles are high enough and claim the tracks that run at a height such as to avoid any impacts.

Graphic examples of the system highlight the adaptability of the network to the hilly terrain and urban infrastructure: buildings, road infrastructure and rail networks. Each pylon (3) has at the base a mechanism of absorption of seismic stress of extreme intensity (19).

The route normally overlaps infrastructured areas with pylons and, where possible, implanted in Residual areas. The network preferably adapts and integrates the route of the existing roads.

The invention provides spatial and urban ductility: it adapts to existing infrastructures and lends itself to involving the towns of various sizes. The connection with existing stations allows a direct integration with the consolidated transport system. The network can be extended with urban journey rings if the scope of existing thoroughfares allow.

The network features, subject of this patent, will become clearer from the description of the attached graphics that follows:

Tables. 1A and I B show the side and top view of the network. It is shown the support grid (2) suspended between two pylons (3) supported by tie rods (4) made of high strength steel strands. The impact with the territory is through the plinths (5) of the pylons. The height of the latter can be variable to allow the network to obtain a smoothed trend independent of the

configuration of the land. Each pylon has at the base a mechanism of absorption of seismic oscillations (19).

Along the rails, suspended to the network (2), the carrier will slide in the two directions (1).

TAV. 1C is the section on the network. It is apparent the location of the pylon (3) and the system of suspension of the tie rods (4) which support the net (2) which is stiffened by transverse trusses to whose lateral ends hang the pairs of rails (6a) within which flow trolleys (5b) of the support carriers. On the constituent grid, photovoltaic panels are placed (26) and the wind turbines that make energy self-sufficient the whole system. On this floor they are located the chambers of infrastructure networks that interconnect the various places reached on the transport network. On each pylon stands a data transmission antenna and commands for the automated functionality of the transport system.

CARRIER (drawings TAW. 2A / B / C / D)

The carrier has the aerodynamic shape with the front part tapering upward. E 'it equipped with a wing flap "canard" and a horizontal tail surface. The graphic attachments express the three configurations. Then it will be needed a study in wind tunnels to determine the optimal configuration.

The carrier will be constructed entirely of light alloy and / or composite material in order to minimize their weight. It will be supported by two pairs of carriages, one front and one rear which, sliding along the rail, guarantee absolute safety and stability. At the two sides of the front carriage will be positioned two propellers (7) consisting of ducted propellers variable pitch and fed by coaxial electric motors. The power needs of propulsion are contained in the order of about 200 KW. The two engines are over emphasised fact although they work in tandem, they are capable of ensuring the propulsion, also individually, in case of failure also thanks to the absence of friction in the sliding guides. The characteristics of the carrier of the patent will be made clearer from the following description of the attached graphics. TAV. 2A shows a front view of the carrier. It can be clearly recognized the rail system (6a) and support carriages (6b) of the carrier to which a pantograph is pending (23). From this graph recognizing the front view of the carrier it is highlighted the position in height of the wing system: that is, the allocation to the fuselage of an aerodynamic sustentation of the system and consists of three bearing surfaces: the front surfaces denominated "canard fins" (8), rear

or tail (10), which together ensure a balance to the rotation in the longitudinal plane, and central or main wings (9) to generate the "lift." This apparatus ensures the controlled balance of the carrier in the three Cartesian directions as well as the force required upward to balance the weight force. Two motors are readable (7) which will be in electric propulsion places straddling the fuselage. TAV. 2B shows in details, through the fuselage cross of the carrier, the parties described above in TAV2A. In the belly of the carrier are housed the service ducts (33). The TAV.2C represents the top view of the carrier. This graph shows the longitudinal locations of the wing system (8,9,10) and engines (7). TAV. 2D is a side view of the carrier. The graph in addition to highlight the lateral shape of the vehicle it highlights the position of the wing and the propulsion system from this point of view. It can be noticed the position of the network and of the carriages from its side view.

THE RAIL SYSTEM / CARRIAGE(**Tables** drawings. 3A/ B/ C/ D).

The rail system is constituted by two longitudinal elements as C-shape downwards such as to contain and to slide the two carriages of anti-wear guides (22) with an alignment system along the rail.

The carriage realized with monolithic carbon steel structure has lower sliding wheels (12a) of lateral sealing wheels (13) and safety superior to the stability of ruote3 (12b). It flows on anti-wear guides (22) ensuring a continuous contact in each load condition. From the body of the carriage protrudes a supporting structure which is anchored to the pantograph (23) of the seal carrier. Such a pantograph (23) is equipped with hydraulic jacks (15 and 16) acts to ensure the leveling of the carrier or the inclination in the different conditions of instability along the advancement. The characteristics of the binary / cart object of the patent will be made clearer from the description of the attached graphics that follows: The TAV.3A shows the side view of the carriage with the vertical location of the wheel system. In TAV. 3C are readable placement of the front vertical sliding wheels (12a), horizontal lateral sealing (12b) and upper vertical safety (13). At the center is the note of the emergency electric motor block (20) whose function is mainly reserved to the circumstances of a failure of both the main engines (7) placed at the sides of the fuselage and handling of the carrier in the starting phases and stop. In the upper part of the track is placed a horizontal plate of the binary system stiffening (32). The TAV.3B shows the top view of the carriage primarily highlights the position of the lateral sealing wheels (13) and the upper vertical

safety wheels (12b) and then the vertical scroll wheels are visible (12a). It is also clear the purpose of the electric motor block (20). To the outer sides are located the inclined plates (24) intended for the cleaning of the inside of the track. the anti-wear bars are recognizable (22) placed under the wheels of both horizontal and vertical scrolling. TAV. 3D depicts the relationship between the track (6a) and the trolley (6b) and the position of the pantograph (23). For each direction to the support grid (2) are suspended the two rails (6a) in the C-shape downwards opening. Inside the binary flow of the carts (6b) whose wheels have different direction of support in order to absorb loads is facing downward (12a), both toward both lateral directions (13) and both upwards (12b). The set of wheels is mounted on a central block (20) which also contains an electric motor which can be activated in the event of failure of the primary thrust system entrusted to electric motors to ducted propeller (7). The wheels run along the anti-wear guides (22).

From the central block (20) are suspended the connecting axes between cart and carrier (21). These axes end with the articulation bearings (18) and to which is coupled a pantograph system (23) consisting of upper connecting rods (14) and lower (17) within which are housed both vertical hydraulic jacks (16) and transverse (15). This system allows the vehicle attached to the underlying bar to oscillate in a controlled way by means of the centrifugal force that is generated in the presence of tangential acceleration, when the trend of the network path assumes a curvilinear or of the lateral thrusts which are generated by the action wind or pylon oscillations caused by earthquakes.

In the 3D table highlights the position of the diagonal stiffening rods (28) in solidarity the pair of rails (6a) also with a horizontal element (28b): both the diagonal rods and the horizontal element are made of high composite dielectric material mechanical strength and are produced with environmentally friendly technologies. horizontal element (28b) are hooked by means of suitable two phase conductors insulators (29) adapted to electrify an average voltage across the STA system. The carrier stands the termination rods (31) ending with two sliding blocks (30) appropriately shaped for the taking, high speed, the current required by the system.

CLAIMS

1. A suspended transportation system that includes:

- A double suspended rail (6a), to the direction of travel, within which slide the carriages (6b) bound in all directions and with electric motors (20);

- From the carts (6b) of the metal rods hang (21) between them made solid to create structural geometries of the pantograph (23).

- Carriers (1), with aerodynamic configuration they are equipped with two propeller engines with electric propulsion (7) and are provided with an apparatus consisting of 3 pairs of wings (8,9,10);

- The pairs of rails (6a) are made solid with each other (28 and 28b), thereby creating a binary to the direction of travel. The two rails are interconnected with horizontal rigid structure (TAV1) obtaining an artificial floor extended for the whole length of the work, thus realizing the system of the network (2);

- The network (2) so formed is suspended by means of the stays (4) of the pylons (3) of variable height which rest to the territory, guaranteeing extreme altimeter adaptability without changing the orography;

- The pillars (3), holders of cable-stayed bridges also provide for vertical connection function for evacuation in case of emergencies and special maintenance;

the transport system is characterized in that each pantograph (23) is constituted by an upper horizontal bar (14), a bottom (17) connected to one another by means of hydraulic jacks (15) (16) managed and coordinated by the electronic control. This system ensures the alignment and inclination of the carrier (2) in the different conditions of instability in both the straight path that curved.

2. The transport system according to claim -1- is based on a load-bearing structure consisting of (TAVV.1A, IB, 1C) pylons (3) resting on plinths (5) from which are isolated with mechanisms of "absorption" seismic oscillations (19). Such "absorbing devices" are also placed at the anchors of the strands with pylons and rails.

3. The system of rails (6a), the network (2) according to claim -1- runs at a variable height above ground level in order to make the same independent of the existing infrastructure network.

4. The structure of the network as claimed in claim -3- consists of a grid (2) supported by the cords (4) connected to the pylons (3). The 2 tracks (6a) Current at the extremes of this network constitute the main supports, stiffened horizontally by a truss system (2) cross-TAV. IB. The two pair of forming the track rails are made solid by diagonal stiffening rods (28) as well as from a support rod (28b) which also performs the support function of the phase conductors.

5. Each rail of the track system (6a) as claimed in claim -3- has the configuration of a "C" shaped profile with the opening facing down within which with all safety flows with "negligible friction" the cart (6b) of the carrier support.

6. The sliding system according to claim -5- uses special carts (6b) consisting of a central block (20) containing an electric motor.

7. The transport system referred to -6- claims is characterized by the fact that the sliding device is accomplished through the branches from the center block (20) of a system of wheels oriented in various directions: vertical downwards facing support (12a); horizontal addressed in both lateral directions suited to the absorption of the tangential thrusts (13); vertical of excess absorption of revolts lift upwards (12b).

8. The transport system referred to in claims -6-, -7- characterized in that the sealing carriage slides on anti-wear guides (22) made solid to the rails (6a) and fixed by means of an apparatus of adjustment and alignment for the entire length.

9. The transport system referred to in claims -6-, -7- is characterized in that the sliding carriage provides protection of the support wheels (12a) a clear obstacles blade (24), in non-deformable steel, suitably shaped and inclined towards the opening of the profile to "C", adapted to remove foreign bodies.

10. The transport system according to claim -1- is characterized by the fact that the lower element (17) of the pantograph (23) is configured adherent to the upper profile of the carrier (1). This support is made of high resistance material and has an aerodynamic configuration characterized by an enlarged base for a greater area of connection to the bearing structure of the carrier.

11. The transport system according to claim -1- is characterized by the fact that the connection system as claimed in claim -10- connects through the lower bar (17) the carrier (1). This is made of light alloy material and has an aerodynamic configuration: the (plates. 2B and 2D) show the flat shape of the section and the outer longitudinal tapered configuration and compact.

12. The transport system according to claim -1- is characterized in that the aerodynamic configuration of the carrier is completed with the allocation to the fuselage of an aerodynamic sustentation mechanism consists of three bearing surfaces: a) front surfaces "canard fins" (8); b) rear or tail (10), which together ensure a balance to the rotation in the longitudinal plane; c) central or main wings (9) to generate the "lift." This provision guarantees the balance of the wings of the carrier in the three Cartesian directions and serves to generate the necessary force upward to balance the weight force. The equivalence between strength and weight-bearing capacity means that the air train system, to cruising altitude, is able to neutralize the existing rolling friction on the wheels on the rails.

13. The transport system according to claim -1- is characterized in that the carrier (1) makes use of two propulsion propellers driven by motors (7) of adequate power to electrical power, positioned in the central area of the outer part top of the carrier (1).

14. The transport system according to claim -1- is characterized by the fact that the power supply for all of the STA system operation is ensured by two termination rods (31), placed above the carrier, which terminate with appropriate sliding shoes (30) which pick up the necessary medium voltage current from the phase conductors (29), anchored along the flow line (28b), with suitable insulators to the dielectric part of the bearing structure.

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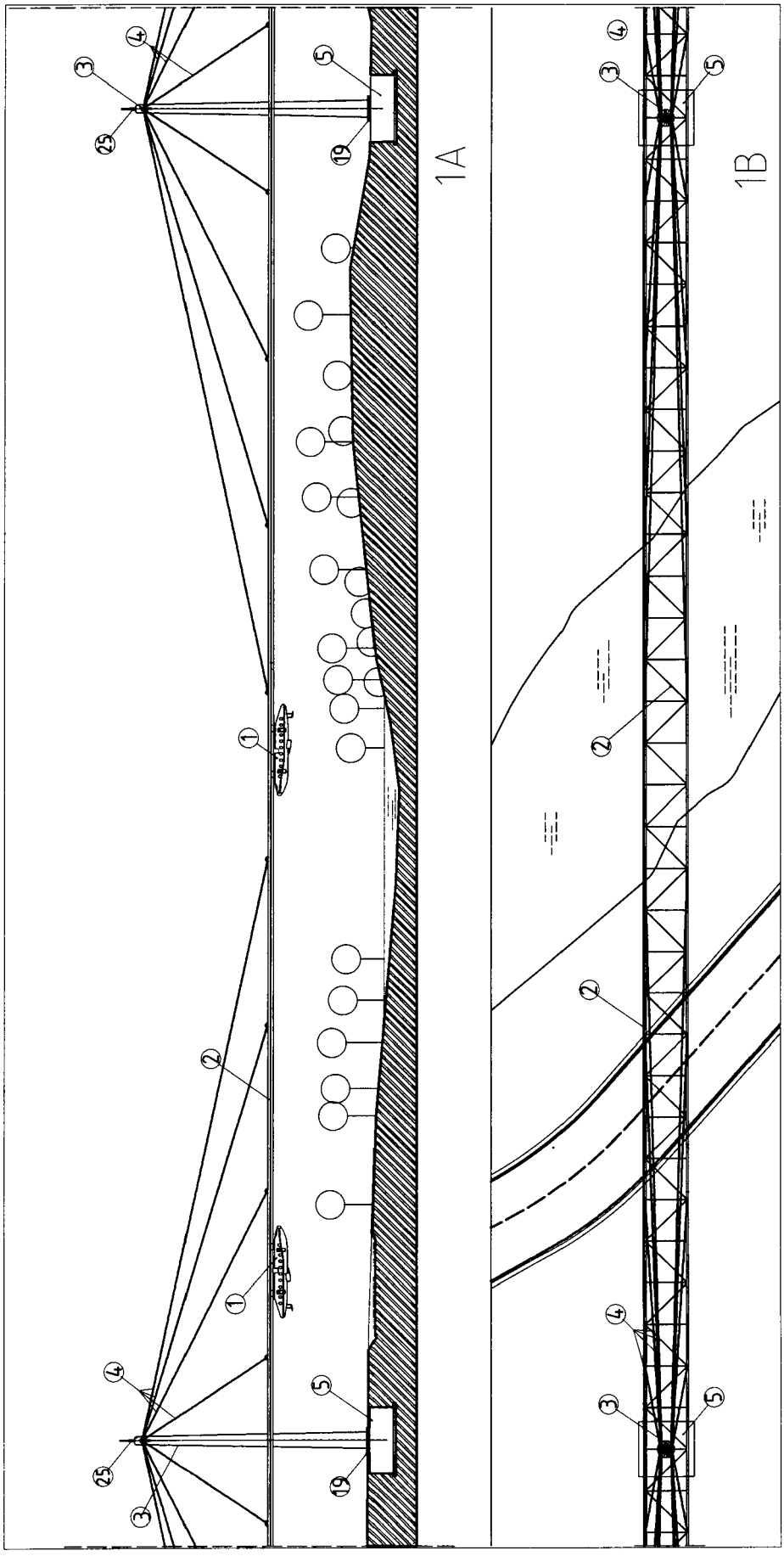

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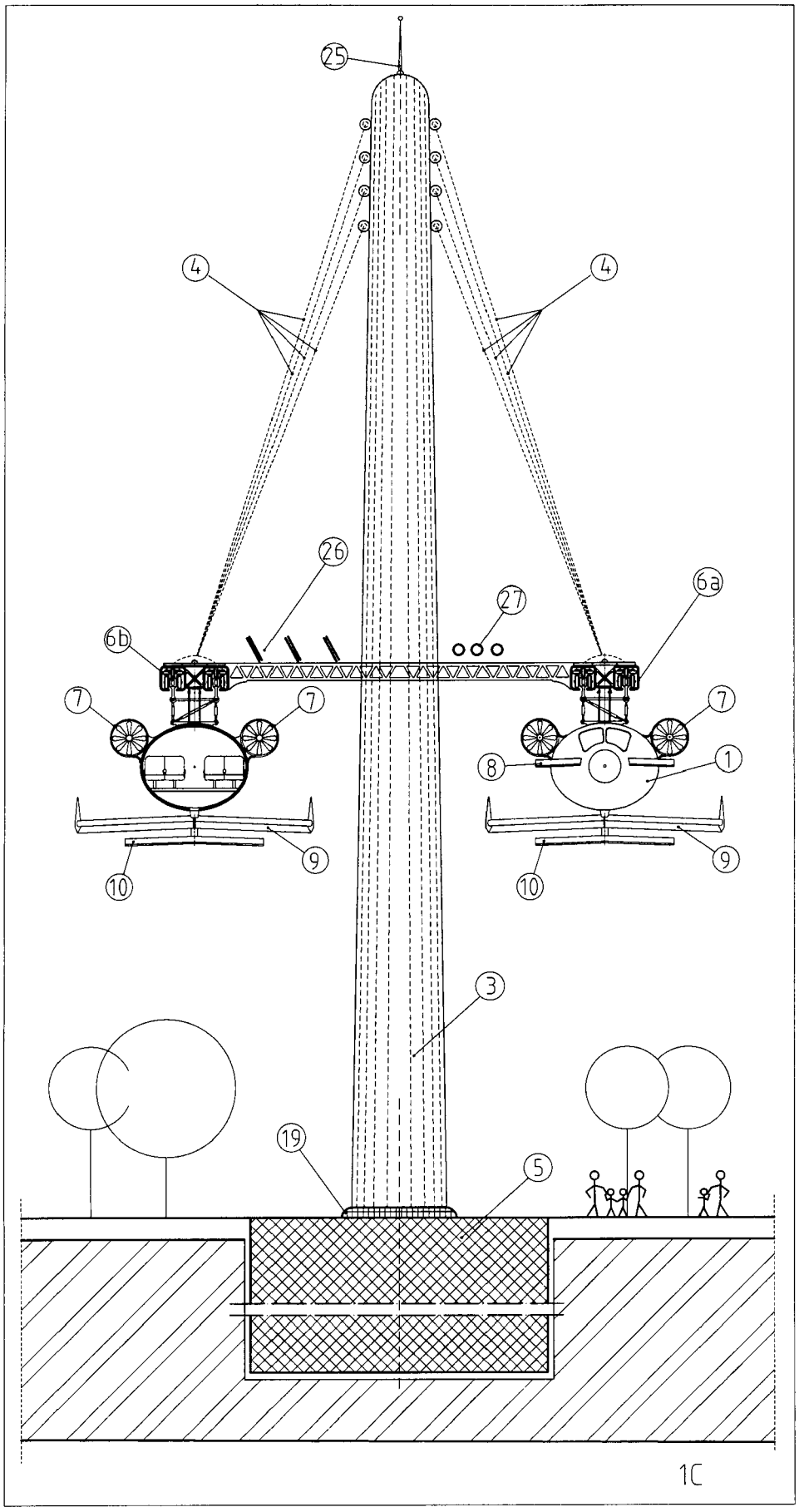

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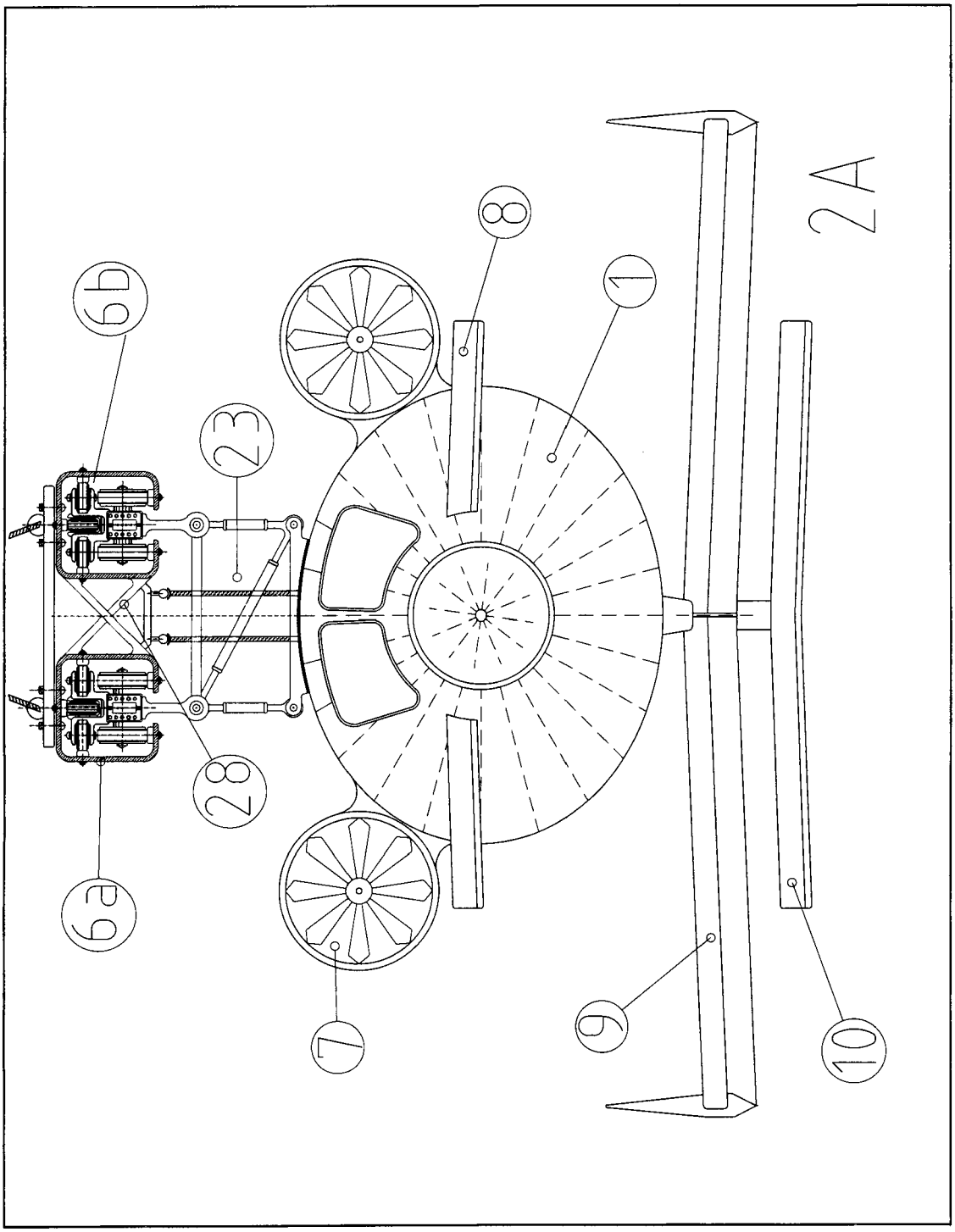

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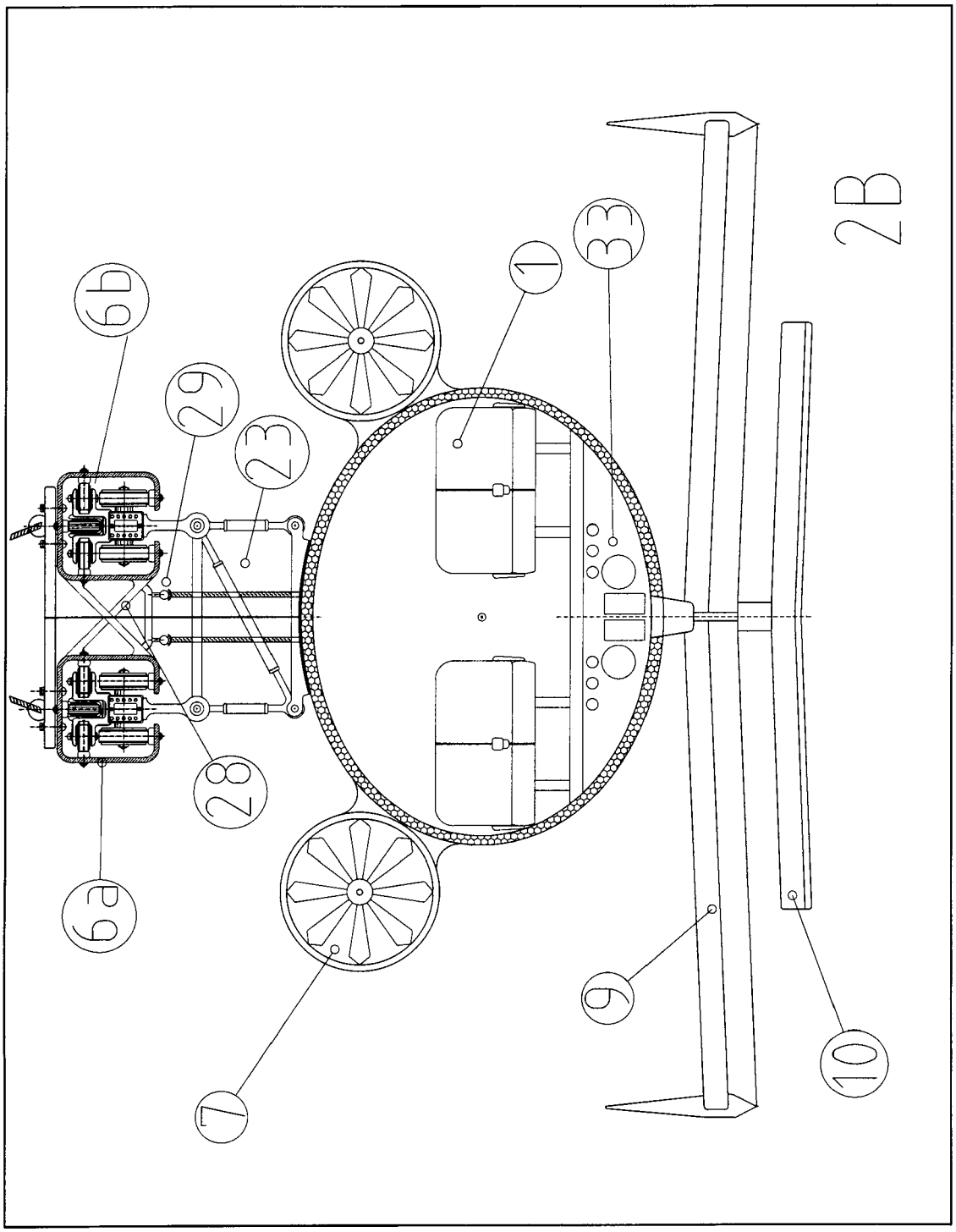

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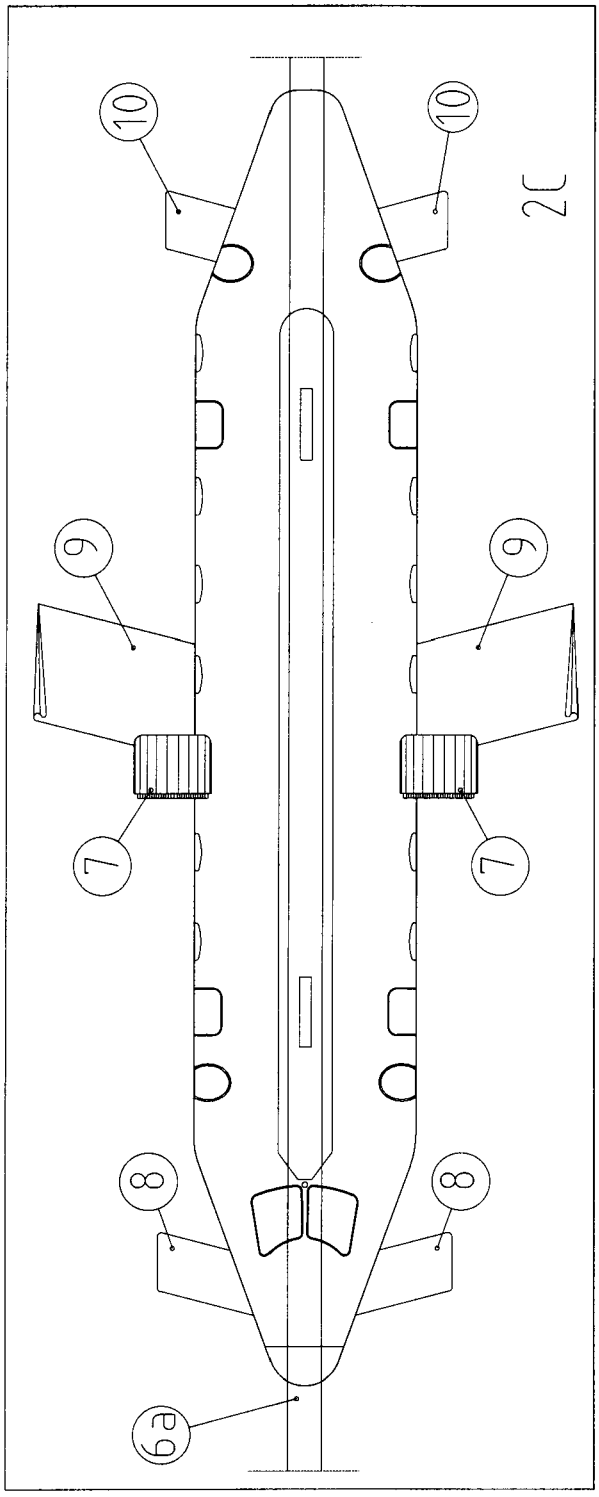

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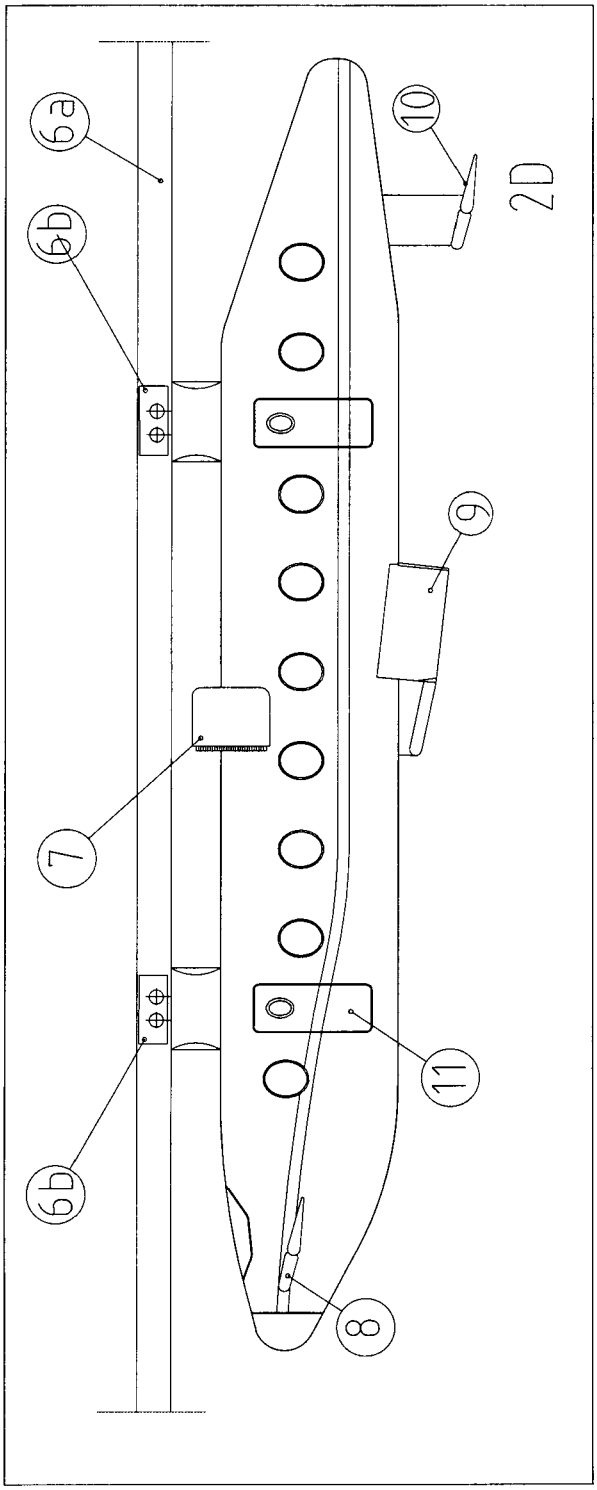

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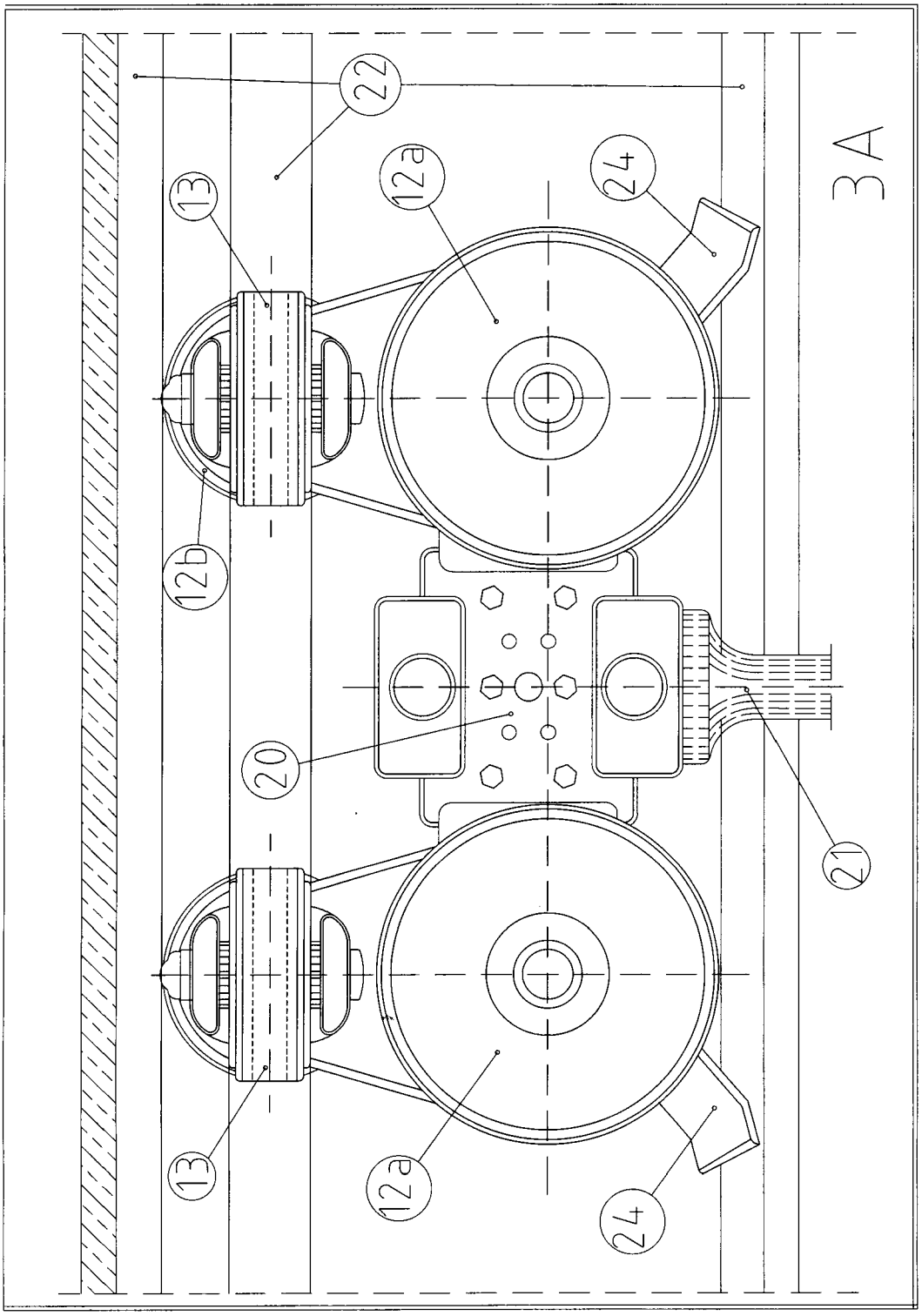

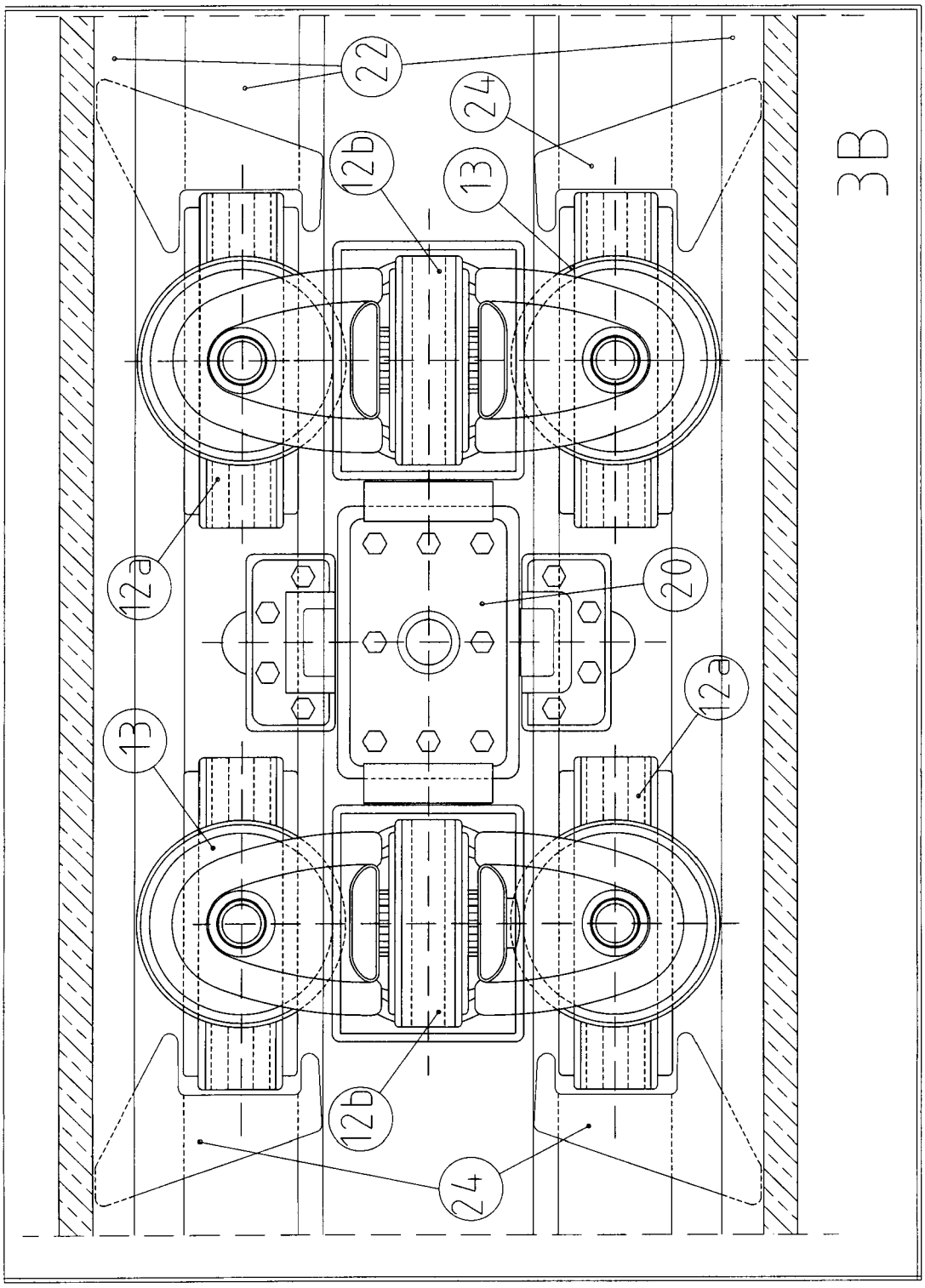
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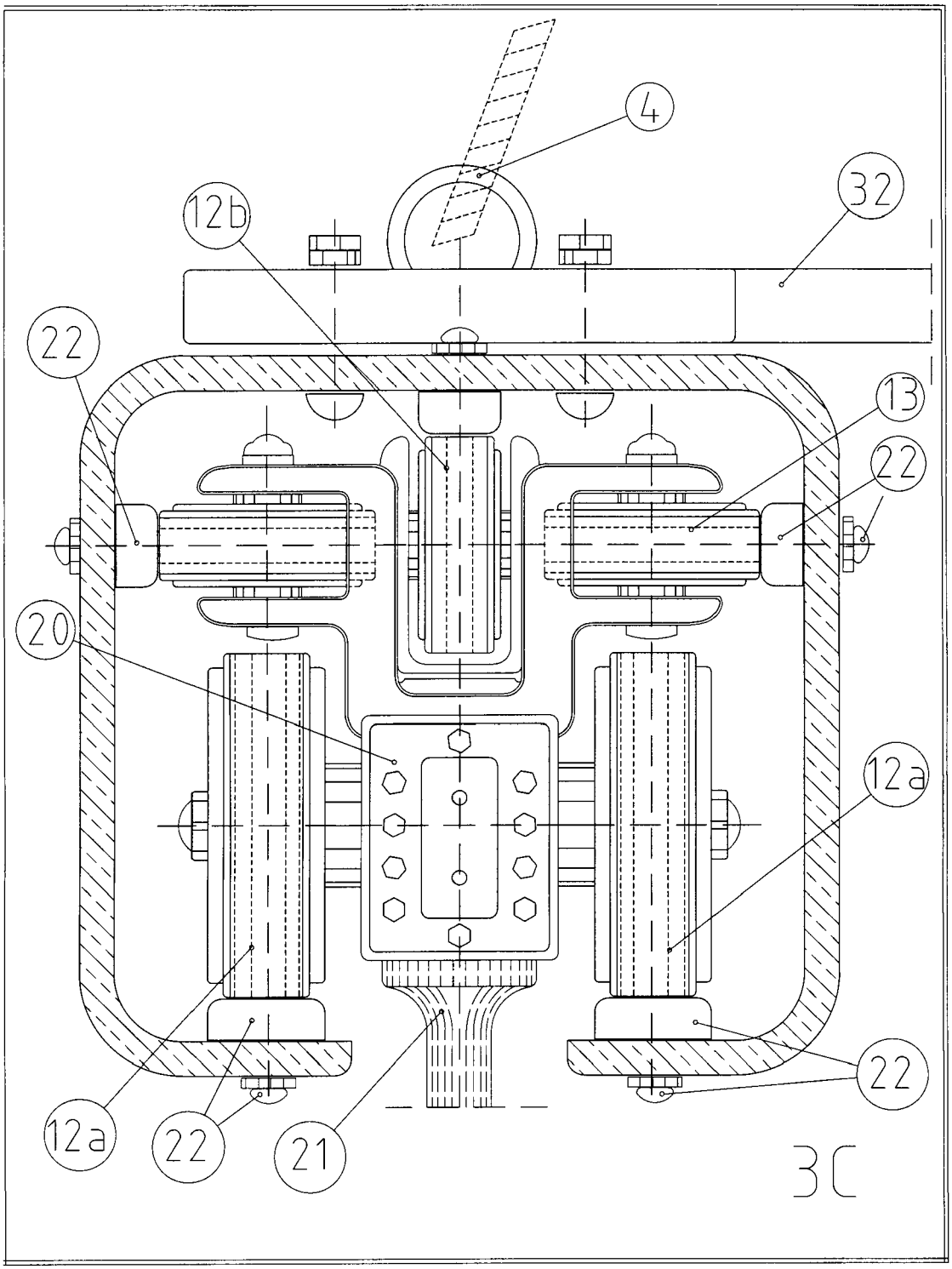

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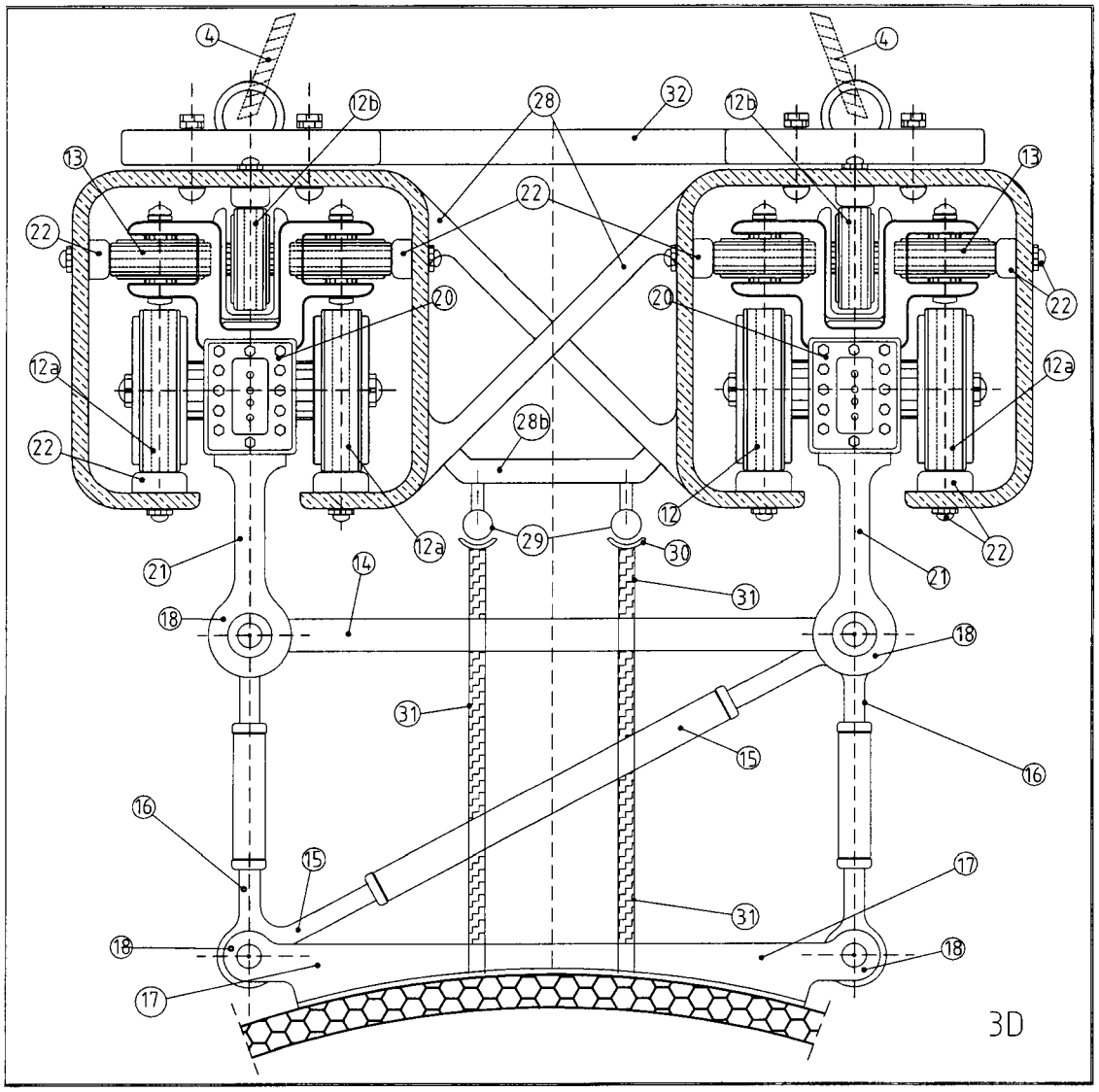

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2017/000036

A. CLASSIFICATION OF SUBJECT MATTER
INV. B61B3/02 B61C11/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B61B B61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 535 963 A (LEHL ELVEST L [US] ET AL) 16 July 1996 (1996-07-16) cited in the application the whole document	1
A	DE 23 29 692 Al (WALSH ROBERT L) 2 January 1975 (1975-01-02) the whole document	1
A	US 8 015 925 B2 (SIMON ABNER J [US]) 13 September 2011 (2011-09-13) cited in the application the whole document	1
A	US 3 244 113 A (SMYSER BERT A) 5 April 1966 (1966-04-05) figures	1

-/- .

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search	Date of mailing of the international search report
5 July 2017	14/07/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Schultze, Yves

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2017/000036

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	BE 712 889 A (SAFEGE TRANSPORT) 31 July 1968 (1968-07-31) figures 1-3	1
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Information on patent family members

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