

Description

[0001] In a first aspect the present invention relates to a bridge, more specifically a motorway bridge, with a span direction and a cross direction, the bridge comprising at least one edge beam, which in turn comprises a beam section extending in said span direction and having at least two sides, a top and a bottom, and a substantially plate-shaped support section extending in the span direction of the bridge and protruding obliquely from and up over the top of the beam section.

[0002] Bridges of the type described above are for instance used as motorway bridges in Denmark, i.e. bridges spanning a motorway to connect stretches of road running at each side of the motorway. Such a prior art motorway bridge 100 for a three-lane motorway is shown schematically in Fig. 1.

[0003] The left part of the illustrated central axis X of the bridge in Fig. 1 shows the bridge 100 seen from the side, whereas the right part shows a cross-section in the span direction S of the bridge. The bridge 100 shown in Fig. 1 has moreover a cross direction T perpendicular to the span direction S and has been approved for the purpose by the Danish authorities and has a number of supports 130 spaced adequately in the span direction S of the bridge, between which, extending in said span direction S, central beams in the form of OT-beams (i.e. beams of inverted T-type) 113 have been mounted for support of concrete topping 112a and road surface 112b. Each of the OT-beams extends typically across a single bridge span of the whole span of the bridge 100. The supports 130 rest on a foundation 129 known to the person skilled in the art.

[0004] The bridge 100 has on each side of the deck a number of (four) reinforced and as to cross-section identical edge beams of concrete, each extending to span a single bridge span in the span direction S of the bridge. Fig. 2 shows an enlarged cross-section along the line II-II in Fig. 1 of one of the prior art edge beams designated 115. As will best be seen from Fig. 2, the edge beam 115 comprises a beam section 101 with a substantially rectangular cross-section and a substantially plate-shaped support section 102, formed integrally with the beam section 101. The smallest width of the beam section 101 is larger than the thickness of the support section 102. The support section 102 extends from one side of the beam section 101 and protrudes obliquely from and up over the top of the beam section 101. The support section 102 extends in parallel with the beam section 101 and likewise in the whole span direction S. The plate-shaped support section 102 has a cross-section, which is substantially L-shaped, the shorter, upper leg 111 extending vertically from and being formed integrally with the oblique, longer leg 108, which is integrally connected with the beam section 101.

[0005] With reference to both Figs 1 and 2 the beam section 101 and the support section 102 both consist of reinforced concrete and contribute i.a. by means of the

web reinforcement 131 of the beam section to fastening reinforcement to other parts of the bridge 100, for instance reinforcement to the concrete topping 112a, such that the edge beam 115 forms sides of the bridge. Extending from and fastened to the support section 102 on the edge of the bridge 100 towards the centre of the cross direction T of the bridge 100 a tensile reinforcement 109 has been provided. The reinforcement 109 is fastened to the longer leg 108 of the support section 102 below the shorter, upper leg 111. The edge beams of the bridge are to absorb great forces in a comparatively uneconomical way, for which reason they are substantially bigger and possess a substantially bigger strength than said OT-beams 113. This results in a very bulky, heavy and consequently costly construction of the edge beams, the edge beam 115 as an example solely weighs up to 65 tonnes or more. An edge beam 115 of this size and weight is with the existing Danish production conditions very difficult to manufacture, and it will in any case involve very big costs and present difficulties to transport such a prefabricated edge beam to the place of use.

[0006] Construction of the motorway bridge 100 described above takes place in the following way - still with reference to Figs 1 and 2.

[0007] First a suitable number of supports 130 are mounted in the span direction S of the bridge, following which, in said span direction S, a suitable number of central beams in the form of OT-beams 113 is mounted for support of the bridge deck. A temporary formwork with associated, temporary support is then erected at the sides of the bridge for casting in situ of the edge beams on each side of the bridge 100 in the actual bridge height. Such a support and formwork are very comprehensive as to workload, price, size and weight, as the support is to carry formwork and edge beams, until the construction is self-supporting (after curing).

[0008] Prior to the start of the casting process, reinforcement, which is to be fastened to and in the edge beams, is mounted. The casting, therefore, involves a comprehensive preparatory work on and around the bridge 100. In addition to reinforcement for the edge beam 115 reinforcement 109 is mounted as mentioned before extending from the edge beam 115 transversely to the span direction S to reinforce subsequently poured concrete topping 112a and road surface 112b. This results in reinforcement of the edge beams in the span direction S and the bridge deck 100 transversely to the span direction S in form of i.a. reinforcement 109 in the concrete topping 112a.

[0009] When support, formwork and reinforcement have been established in a suitable way, the very casting process can be started, during which the beam section 101 and the support section 102 thus are cast in their final positions in the actual bridge height. The casting process becomes more expensive due to the fact that big, costly machines are to be used in situ to make a temporary formwork and support and to produce and pour concrete in the formwork. Apart from being compli-

cated and time consuming this casting process has also turned out to have a very unfortunate effect on the safety at work in connection with the construction and the casting work. Among others reference can be made to a fatal accident near Aalborg, Denmark in the spring of 2006 - an accident, which occurred due to a collapse of a temporary support construction in connection with the building of a motorway bridge.

[0010] A possible alternative for the person skilled in the art to said method for providing the edge beam 115 is to cast it on the ground and then lift it to the actual bridge height. In this way the above-mentioned temporary constructions can to some extent be avoided. However, it requires big machines to lift the finished edge beam 115 in position, for which reason this is a correspondingly costly and time consuming method.

[0011] As is generally the case in connection with constructions cast in situ, it is not possible to control and assure the casting process as to quality to the same extent as a production (perhaps a mass production) in a factory.

[0012] When the concrete is cured, and the construction has become self-supporting, temporary support and formwork may be taken down and removed. It is, therefore, the question of a costly and time consuming work both before, under and after the casting process, the area on and around the bridge 100 having to be cut off. This is in particular a problem in connection with motorway bridges, as motorways, are heavily crowded transport routes. The traffic situation in an area will, therefore, be substantially influenced in the comparatively long period, where the construction work goes on.

[0013] The object of the invention is with a view to the above-mentioned drawbacks of the prior art to provide a bridge, which can be constructed in an easier, cheaper, quicker and safer way.

[0014] This object is attained by means of a bridge of the type mentioned in the introduction, this bridge being characterized in that the beam section and the support section are formed separately, the beam section at one side comprises a contact face, and the support section comprises at least two support section parts, which each comprises at least one side face and a lower end face, the support section parts being mounted with their respective side faces abutting one another and their respective lower end faces abutting the contact face of the beam section, such that the support section rests on the beam section.

[0015] In this way a particular division of the edge beam into a beam section and at least two support section parts is attained, said smaller parts being on account of their considerably smaller size and weight far easier to prefabricate in a factory as concrete elements and to transport to the site of use. The beam section, which will typically be the biggest and heaviest part, will thus in normal cases weigh under one third (typically approx. 20 tonnes) of the prior art edge beam. At the same time the parts, in particular the support section parts, can be mass-pro-

duced and used as modules in different bridges.

[0016] An edge beam in a bridge according to the invention can be mounted directly on the bridge without temporary formwork and support. Thus, the building time gets substantially shorter, and at the same time the safety at work is considerably increased. Due to the comparatively small sizes of the edge beam parts all bridge parts may be mounted by use of the same machines, which are necessary for building the remaining parts of the bridge. Thus, bigger machines for mounting the edge beams in a bridge according to the invention are not necessarily required.

[0017] As the casting process of the edge beam parts in building height can be avoided, and only comparatively small parts are to be lifted and mounted on the bridge, the safety in connection with the work on the bridge is substantially increased relative to the known motorway bridges.

[0018] As the parts may be in the form of prefabricated concrete elements, the actual working time with the construction of the bridge is considerably reduced. The necessary barring of the area below the bridge is considerably reduced, and for the mounting of the edge beam no temporary support, formwork and casting equipment on and around the bridge will be needed, which contributes to a saving of material and time. Therefore, the construction time is substantially shortened, and as a consequence the invention provides, in addition to the concrete fiscal savings, traffic advantages in connection with the building work. The invention ensures that the bridge is substantially self-supporting all the time with the subsequent structural advantages and advantages as to safety resulting from this.

[0019] Finally, it is also from other reasons possible to construct the bridge according to the invention with lesser costs than the prior art bridge, as the dimensions of the edge beam can be smaller. When the edge beam according to the prior art is cast integrally, it is difficult to establish a satisfactory distribution of the concrete by vibration, as the edge beam comprises the protruding support section. When the beam section and the support section are separate sections, it is therefore possible to cast at least the support section with far smaller thickness of material than according to the prior art. This entails saving of material in respect of the support section itself, but also in respect of the remaining parts of the bridge construction, for instance the beam section, as the total weight of the edge beam will be reduced.

[0020] The bridge according to the invention resembles also with regard to statics to a high degree the known motorway construction, which is approved by the Danish authorities, but the quality of the construction can be better controlled, the construction is more safe, less time consuming and considerably cheaper to manufacture and erect.

[0021] In a preferred embodiment the support section protrudes obliquely from the beam section at an angle relative to a horizontal plane of 5-45 degrees, preferably

10-30 degrees and more preferred about 15 degrees. In this way the support section will rest on the beam section, such that the support section mainly absorbs pressure and to a smaller degree moment.

[0022] In another preferred embodiment the support section comprises reinforcement, which at one end is fastened below the upper leg of the support section and extends substantially horizontally towards the centre of the cross direction of the bridge to be fastened to the remaining bridge structure. In this way the support section will to an even higher degree absorb pressure. The support section is preferably substantially L-shaped, a lower leg of the L-shaped cross-section protruding obliquely from the beam section to form said plate-shape of the support section and an upper leg extending substantially vertically from a part of the support section opposite the end face of the support section, and the tensile connections of the support section are fastened below the upper leg of the L-shaped cross-section. In this way the support section may also constitute a formwork for the casting of concrete topping and road surface.

[0023] In a preferred embodiment the bridge spans a number of bridge spans and comprises a number of edge beams, which are mounted and coaxially extending at each end of the cross direction of the bridge, i.e. at the sides or edges of the bridge, such that each edge beam extends substantially across one of the bridge spans of the bridge.

[0024] In another aspect the invention provides a method for the construction of a bridge, more specifically a motorway bridge, with a span direction and a cross direction, the method comprising the steps of:

- providing a beam section with at least two sides, a top and a bottom as well as a contact face on at least one side and a substantially plate-shaped support section formed separately from the beam section and comprising at least two support section parts, each comprising at least one side face and a lower end face,
- mounting the beam section at the end of the cross section of the bridge such that it extends in the span direction of the bridge, and
- mounting the support section parts such that they extend in the span direction of the bridge and protrude obliquely from and up over the top of the beam section, that the respective side faces of the support section parts abut one another and that the respective lower end faces of the support section parts abut the contact face of the beam section, whereby the support section rests on the beam section such that the beam section and the support section forms an edge beam of the bridge.

[0025] In the following the invention will be explained in detail by means of examples of embodiments and with reference to the schematic drawing, in which

Fig. 1 shows a motorway bridge according to prior art, the bridge being on the left side of a central axis X viewed from the side and on the right side of the axis X being viewed in a central cross-section in the span direction S of the bridge,

Fig. 2 is an enlarged cross-sectional view along the line II-II in Fig. 1 of a prior art edge beam of the motorway bridge according to Fig. 1,

Fig. 3 corresponds to the view of Fig. 1 and shows a motorway bridge according to an embodiment of the first aspect of the invention,

Fig. 4 is an enlarged cross-sectional view along the line IV-IV in Figs 3, 5 and 6 of an edge beam,

Fig. 5 is a first perspective view of the edge beam according to Fig. 4, and

Fig. 6 is a second perspective view of the edge beam according to Fig. 4.

[0026] Figs 3 to 6 show an embodiment of a motorway bridge 200 according to the first aspect of the invention. The parts of the bridge 200 corresponding to the parts of the known motorway bridge 100 described above (Figs 1 and 2) are given the same reference numerals increased by 100.

[0027] Fig. 3 shows a preferred embodiment of the invention in the form of a motorway bridge 100, the overall appearance of which, also with regard to statics, resembles the prior art bridge 100 described by way of introduction. The bridge 200 shown in Fig. 3 differs in particular from the known bridge 100 in its construction of the edge beams, and one of the edge beams designated 215 will be described by way of example in the following. The remaining edge beams of the bridge correspond as to construction to the exemplary one, 215. The invention is not to be understood as being limited to use in connection with motorway bridges, and the person skilled in the art will be able to apply the described principles in other types of bridge constructions.

[0028] To the left of the axis X the bridge is seen from the side, whereas on the right side a cross-section is seen in the span direction S of the bridge. Moreover, the bridge 100 has a cross direction T perpendicular to the span direction S.

[0029] The bridge 200 is in the same way as the known bridge 100 constructed with supports 230, which at the ends of the span of the bridge 200 are in the form of an elevated floor plan of the supporting face 229 of the bridge, whereas in between they are spaced adequately in the form of three columns in the span direction S of the bridge. Two three-lane motorways 228a, 228b indicated by car silhouettes 227 run between the respective supports 230. The number of supports in the embodiment shown in Fig. 3 is of course not to be considered as a limitation of the invention; any adequate number of supports may be used in a given situation.

[0030] As will be seen from the cross section to the right of the axis Z, central beams have been provided between the supports 230 of the bridge 200 in the span

direction S of the bridge. The central beams are in the form of OT-beams 213 of concrete, which support the concrete topping 212a and road surface 212b of the bridge, but other designs of the central support of the bridge may be used within the scope of the invention.

[0031] At each of the two sides of the bridge 200 an edge beam resting on the supports 230 has been placed above each span, such that the edges of the bridge 200, which in the embodiment shown are made up by four edge beams, respectively, coaxially placed in extension of one another, extend in parallel with each other in the span direction S of the bridge.

[0032] Fig. 4 is a detailed sectional view IV-IV of an edge beam 215 of the two edge beams visible in Fig. 3 to the left of the bridge 200. Fig. 4 is thus a sectional view corresponding to the sectional view in Fig. 2 of the prior art edge beam 115. The edge beams not visible in Fig. 3 at the opposite side of the bridge 200 are built up symmetrically over a centre plane in the spanning direction S.

[0033] As will best be seen in Fig. 4, the edge beam 215 comprises a beam section 201 and a support section 202, which in the embodiment shown together form the edge beam 215. Figs 5 and 6 are two different perspective views of the edge beam 215, from which will be seen that the support section 202 are made from in all five support section parts 202a, 202b, 202c, 202d, one (in the figures to the left) of the support section parts being omitted in order to give a better view of the beam section 201. The invention is not to be understood as being limited to the number of support section parts shown. Both the beam section 201 and the support section parts 202a, 202b, 202c, 202d are in the embodiment shown in Figs 3 to 6 separately cast, prefabricated reinforced concrete elements. Also tensile connections in the form of tensile reinforcement 209 are shown in figs 4 to 6.

[0034] As will be seen from Fig. 4, the cross-section of the beam section 201 is substantially rectangular with two sides 232 and 233, a top 204 and a bottom 205. The person skilled in the art will be able to conceive other suitable designs of the cross-section of the beam section 201. The side 233 to the right in Fig. 4 is from below slightly inclined away from the beam section 201 to abut a contact face 203, which is formed as a recess in the substantially rectangular cross-section of the beam section 201. The beam section 201 is a self-supporting construction connecting the supports 230. The contact face 203 serves as support for the support section 202, an end face 207 of the support section 202 resting thereon.

[0035] The contact face 203 forms in the preferred embodiment a right angle α , one leg of which extends perpendicularly from the side 233 of the beam section 201 and the second leg of which is constituted by a part of the side 233. The angle α is not necessarily right, just as the contact face 203 may be designed in any other suitable way. At the contact surface 203 means may further be provided, for instance protruding reinforcements, for temporary fastening of the support section 202 to the beam section 201 during the mounting of the edge beam

215.

[0036] On the upper side 204 of the beam section 202 reinforcement clamps 231 are provided among others for fastening the tensile reinforcement 209 from the support section 202 and reinforcement of concrete topping 212a in the span direction S of the bridge. The tensile reinforcement 209 is at one end fastened to a lower leg 208 of the support section 202 and extends from there in the cross direction T of the bridge from the support sections 202 towards the centre of the cross-section of the bridge 200. At its other end the tensile reinforcement 209 is fastened to the remaining part of the bridge construction or to an edge beam not shown at the opposite edge of the bridge. Moreover, the beam section 201 may, as is known to the person skilled in the art, be provided with reinforcement on other sides of the beam, where it is advantageous for mounting and strengthening purposes. As is shown in Fig. 5, the side 232 of the beam section 201 facing the centre of the bridge 200 is for instance provided with reinforcement 225 for reinforcement of a part 224 of the concrete deck of the bridge 200. These and remaining parts of the reinforcement of the bridge 200 may for instance be in the form of threaded rods, hooks or angles and may in all places be pre-tensioned or post-tensioned.

[0037] The reinforced support section 202 comprises, as will be seen from Figs 5 and 6, a number of support section parts 202a, 202b, 202c, 202d, which rest on the contact surface 203 of the beam section 201 as explained above. The support section parts 202a, 202b, 202c 202d are "substantially plate-shaped", which term is to mean that a length and a width of the parts are substantially longer than a depth, the parts, can, however, be provided with for instance angles and other irregularities, which is the case in the present embodiment. As will best be seen from Fig. 4 to 6, the support section parts 202a, 202b, 202c, 202d extend mutually coplanarly in the span direction S of the bridge 200 and protrude obliquely from and up over the top 204 of the beam section 201. This makes the support section parts 202a, 202b, 202c, 202d, which are substantially similar, extend coplanarly in extension of one another in the span direction S of the beam section and thereby constitute the support section 202, as will be seen from Figs 5 and 6.

[0038] As mentioned above a lower end face 207 of the support section parts 202a, 202b, 202c, 202d abut the contact face 203 of the beam section 201, whereas side faces 206 of the support section parts 202a, 202b, 202c, 202d abut one another to form the longitudinally coplanar configuration of the support section parts 202a, 202b, 202c, 202d. The support section parts 202a, 202b, 202c, 202d have in the embodiment shown an overall plate thickness, which corresponds to between $\frac{1}{4}$ and $\frac{1}{3}$ of the shortest distance between its two sides 232, 233 of the beam section 201, i.e. approximately half of the corresponding thickness of the prior art support section 102 (see Fig. 2). When making the support section parts 202a, 202b, 202c, 202d as prefabricated concrete

plates, it is even with a thickness as small as this possible to obtain a degree of strength of the edge beam 215, which corresponds to that of the edge beam 115 of the prior art bridge 100. Means may also be provided between the support section parts 202a, 202b, 202c, 202d, for instance in the end faces 206, for temporary securing of the support section parts 202a, 202b, 202c, 202d to one another during mounting.

[0039] In the preferred embodiment the cross-section of the support section 202 is substantially L-shaped, the lower leg 208 of the L-shaped cross-section extending obliquely from the beam section 201. In the embodiment shown in Figs 3 to 6, the support section 202 is thus placed on the contact face 203, such that an angle β is formed relative to a horizontal plane of about 15 degrees, see Fig. 4. Thus a pressure is created in the lower leg 208 of the L-shaped plate cross-section towards the beam section, when the tensile reinforcement 209 from the support section 202 is fastened to and secured to the remaining bridge construction. In this connection the tensile reinforcement 209 contrary to the tensile reinforcement 109 of the prior art bridge (Figs 1 and 2) is used for stabilizing the support section 202 during the mounting of the bridge 200. The tensile connections of the bridge, which in the embodiment shown are in the form of tensile reinforcement 209, thus have a considerably different function than that of the prior art tensile reinforcement 109. However, the tensile reinforcement 209 is preferably also used for reinforcement of part of the bridge deck, but this need not necessarily be the case. Thus, the tensile connections are not necessarily in the form of reinforcement iron, but may also fulfil their primary function, if they e.g. are made from carbon fibre or plastic material. The pressure effect mentioned can be obtained to a satisfactory degree for angles from 5-45 degrees, preferably 10-30 degrees and more preferred about 15 degrees as shown in the figures.

[0040] An upper leg 211 of the L-shaped support section 202 extends substantially vertically from a part of the support section 202 opposite the lower end face 207 of the support section 202. In this connection the upper leg 211 of the L-shaped cross-section constitutes in particular a framework during the casting of the concrete topping 212a and the road surface 212 during mounting of the bridge 200.

[0041] The L-shaped cross-section of the support section 202 is not to be understood as limiting relative to the invention, but imparts to the bridge 200 a configuration corresponding to the prior art bridge 100.

[0042] The tensile reinforcement 209 of the support section 202 is fastened under the vertical leg 211 of the plate- and L-shaped support section 202, such that it extends in the cross direction T of the bridge perpendicularly to the span direction S of the bridge.

[0043] The bridge according to the invention is not restricted to the manufacture of the concrete section and the support section from prefabricated concrete elements. These sections may as already mentioned also

be constructed as sections cast in situ, or they may be made from a different, suitable material, for instance steel or plastic. Likewise, the edge beam of the bridge according to the invention does not necessarily span a single bridge span - it is within the scope of the invention that the edge beam or the edge beams of the bridge span several or all bridge spans of the bridge.

[0044] In the following an example of a method according to the second aspect of the invention for the construction of a bridge 200, more specifically a motorway bridge, will be explained with reference to Figs 3 to 6.

[0045] At the outset the centre construction of the bridge 200 is mounted (after the necessary digging work, etc.) on supports 213 as explained in connection with the description of the prior art.

[0046] Both the beam sections 201 and the support section parts 202a, 202b, 202c, 202d are prefabricated as reinforced concrete elements in a factory and subsequently transported to the building site, where they are then mounted on the bridge 200. It is, of course, possible to cast some of the parts in situ in connection with the building site, but it is for the above reasons preferred to cast them in a factory. The concrete elements are reinforced in order to acquire the right properties for the construction and are further during the casting provided with said reinforcement, which protrudes from the concrete elements for mounting on the remaining bridge construction. As will be evident for the person skilled in the art, some of the elements, such as for instance the support section parts 202a, 202b, 202c, 202d, may be formed without reinforcement, if the construction so permits.

[0047] The tensile reinforcement 209 protruding from the support section parts 202a, 202b, 202c, 202d and being mounted on the support section 202 facilitates as mentioned the work during mounting of the bridge 200, as it is used for the purpose of letting the end faces 207 of the support section parts 202a, 202b, 202c, 202d rest on the contact surface 203.

[0048] When the longitudinal OT-beams 213 and the beam sections 202 are mounted to connect the supports 213 in the span direction S of the bridge, the support section parts 202a, 202b, 202c, 202d can be mounted one by one on the contact surface 203 of the beam section 201, and the tensile reinforcement 209 protruding from the support section parts 202a, 202b, 202c, 202d is fastened to the remaining construction for instance in the form of the OT-beams, an opposite edge beam (not shown) or the clamp reinforcement 231 of the beam section 201.

[0049] Finally, the deck of the bridge is established, the concrete topping 212a with the tensile reinforcement 209 is cast, following which the road surface 212b can be laid. It is then within the scope of the second aspect of the invention possible to take down the support section 202, such that it will have the function of a temporary formwork.

Claims

1. A bridge (200), more specifically a motorway bridge, with a span direction (S) and a cross direction (T), the bridge comprising at least one edge beam (215), which in turn comprises
a beam section (201) extending in said span direction (S) and having at least two sides (232, 233), a top (204) and a bottom (205), and
a substantially plate-shaped support section (202) extending in the span direction (S) of the bridge and protruding obliquely from and up over the top of the beam section (201),
characterized in that
the beam section (201) and the support section (202) are formed separately,
the beam section (201) at one side comprises a contact face, and
the support section (202) comprises at least two support section parts (202a, 202b, 202c, 202d), which each comprises at least one side face (206) and a lower end face (207), the support section parts being mounted with their respective side faces (206) abutting one another and their respective lower end faces (207) abutting the contact face (203) of the beam section (201), such that the support section (202) rests on the beam section (201).
2. A bridge (200) according to claim 1, characterized in that the support section (202) protrudes obliquely from the beam section (201) at an angle (ρ) relative to a horizontal plane of 5-45 degrees, preferably 10-30 degrees and more preferred about 15 degrees.
3. A bridge (200) according to claim 1 or 2, characterized in that the beam section (201) and the support section parts (202a, 202b, 202c, 202d) are prefabricated elements of reinforced concrete.
4. A bridge (200) according to one of the preceding claims, characterized in that the support section (202) comprises tensile connections (209), which at one end are fastened below the upper leg (211) of the support section (202) and extend substantially horizontally towards the centre in the cross direction (T) of the bridge (200) to be fastened to the remaining bridge structure.
5. A bridge (200) according to claim 4, characterized in that the cross-section of the support section (202) is substantially L-shaped, a lower leg (208) of the L-shaped cross-section protruding obliquely from the beam section (201) to form said plate-shape of the support section (202) and an upper leg (211) extending substantially vertically from a part of the support section (202) opposite the end face (207) of the support section (202), and that the tensile connections (209) of the support section (202) are fastened below the upper leg (211) of the L-shaped cross-section.
6. A bridge (200) according to claim 3 and claim 4 or 5, characterized in that the tensile connections (209) of the support section (202) are fastened to top reinforcement (231) of the beam section (201).
7. A bridge (200) according to one of the preceding claims, characterized in that the support section parts (202a, 202b, 202c) are substantially uniform, prefabricated concrete elements extending preferably coplanarly in the span direction (S) of the bridge in extension of one another.
8. A bridge (200) according to one of the preceding claims, characterized in that the contact face (203) of the beam section (201) forms an angle (α), one leg of which protrudes laterally from the beam section (201), the contact face (207) being preferably a recess in the beam section (201).
9. A bridge (200) according to one of the preceding claims, characterized in that the support section (202) has an overall plate thickness, which corresponds to between $\frac{1}{4}$ and $\frac{1}{3}$ of the shortest distance of the beam section (202) between its two sides (232, 233).
10. A bridge (200) according to one of the preceding claims, characterized in that the bridge (200) spans a number of bridge spans and comprises a number of edge beams (215), which are mounted and extend coaxially at each end of the cross direction (T) of the bridge (200), i.e. at the sides or edges of the bridge (200), such that each edge beam (215) extends substantially across one of the bridge spans of the bridge (200).
11. A method for the construction of a bridge (200), more specifically a motorway bridge, with a span direction (S) and a cross direction (T), the method comprising the steps of:
 - providing a beam section (201) having at least two sides (232, 233), a top (204) and a bottom (205) as well as a contact face (203) on at least one side (232, 233) and a substantially plate-shaped support section (202) formed separately from the beam section (201) and comprising at least two support section parts (202a, 202b, 202c, 202d), each comprising at least one side face (206) and a lower end face (207),
 - mounting the beam section (201) at the end of the cross section of the bridge (200) such that it extends in the span direction (S) of the bridge, and

- mounting the support section parts (202a, 202b, 202c, 202d), such that they extend in the span direction (S) of the bridge (200) and protrude obliquely from and up over the top (202) of the beam section (201), that the respective side faces (206) of the support section parts (202a, 202b, 202c, 202d) abut one another and that the respective lower end faces (207) of the support section parts (202a, 202b, 202c, 202d) abut the contact face (203) of the beam section (201), whereby the support section (202) rests on the beam section (201) such that the beam section (201) and the support section (202) form an edge beam (215) of the bridge (200).
12. A method according to claim 1, comprising the additional step that the beam section (201) and/or the support section (202) are provided in the form of prefabricated concrete elements of reinforced concrete, which are pre-cast prior to the steps of mounting the elements.
13. A method according to claim 11 or 12, comprising the additional step that the bridge deck is mounted across a number of bridge spans, and that a number of edge beams (215) are mounted and coaxially extending at each end of the cross direction (T) of the bridge (200), i.e. at the sides or edges of the bridge (200), such that each edge beam (215) extends substantially across one of the bridge spans of the bridge (200).
14. A method according to one of the claims 11 to 13, comprising the additional step of fastening tensile connections (219) to the support section (202) such that at one end they are fastened to an upper part of the support section (202) and that from here they are suspended substantially horizontally towards the centre of the cross direction (T) of the bridge (200) to be fastened to the remaining bridge construction, the tensile connections (219) being preferably used for reinforcement of the concrete topping (212a) of the bridge.
15. A method according to one of the claims 11 to 14, further comprising the step of using the support section (202) as formwork when pouring the concrete topping (212a) and the road surface (212b) and preferably removing the support section (202) after said pouring.

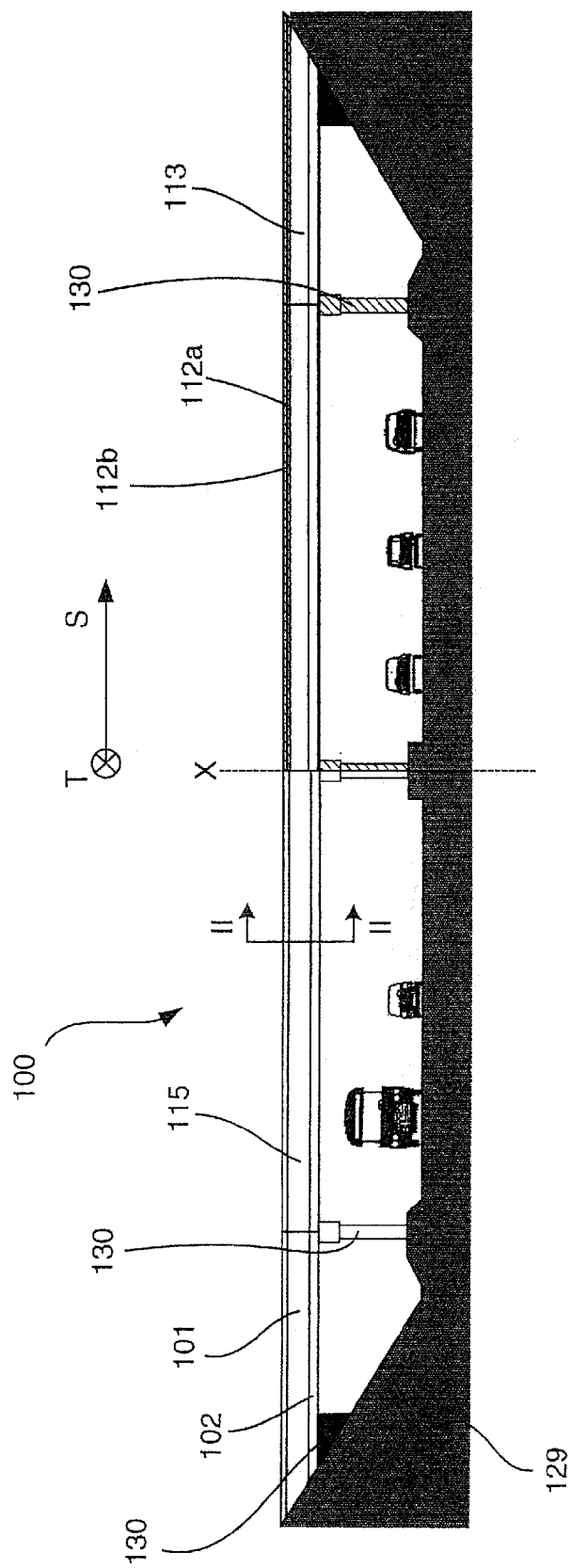


Fig. 1 (Prior art)

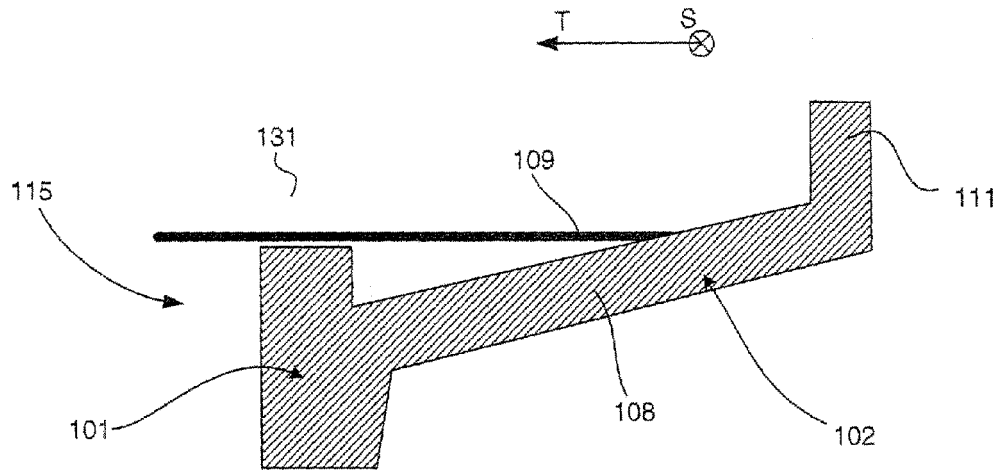


Fig. 2 (Prior art)

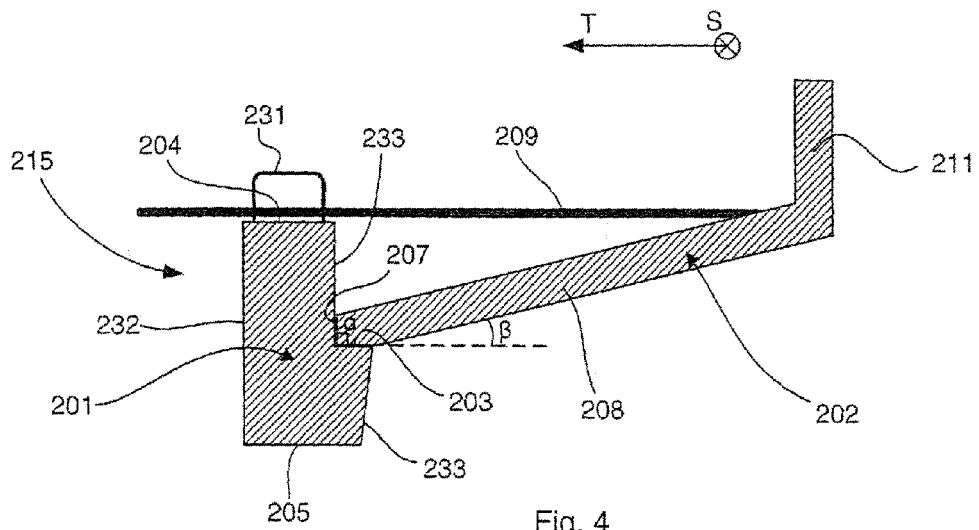


Fig. 4

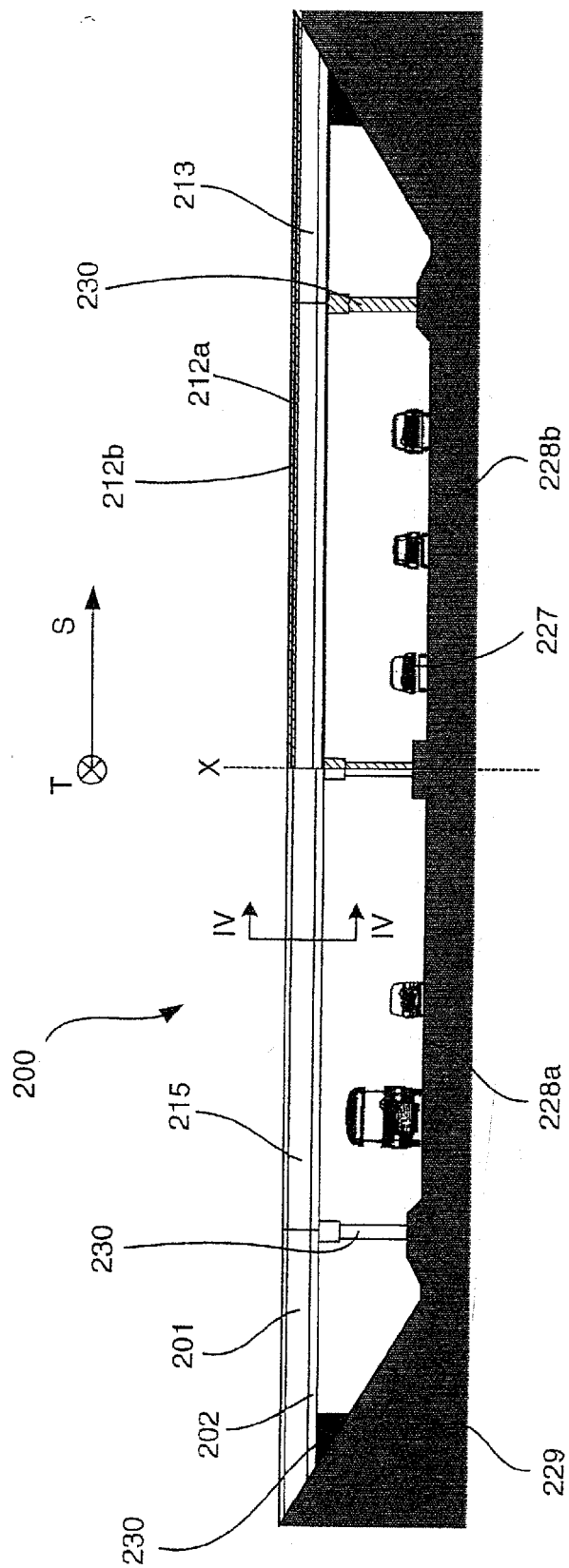


Fig. 3

