(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 611 847 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **94500014.9**

(51) Int. Cl.[5] : **E01B 26/00**

(22) Date of filing : **03.02.94**

(30) Priority : **19.02.93 ES 9300329**

(43) Date of publication of application :
24.08.94 Bulletin 94/34

(84) Designated Contracting States :
AT BE CH DE DK FR GB GR IE IT LI LU MC NL PT SE

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(54) Fixed installation for changing the railways gage.

(57) A fixed installation (1) for changing the railway gage, being designed to allow the gage to be changed with the trains running, and being formed as an installation (1) located on a pit constituted by a reinforced concrete work on which different tracks (2,3), rail bearers, rails and guard rails, with different resilient elements (9,9'), are located, all of them being interconnected with a length of track (2) having a given gage (A) located on a side of the installation, while at the other end of the installation (1) there is a second length of track (3) of a different gage, the automatic change of the axle widenning being carried out on the center zone of the installation (1), notwithstanding the sense of the run.

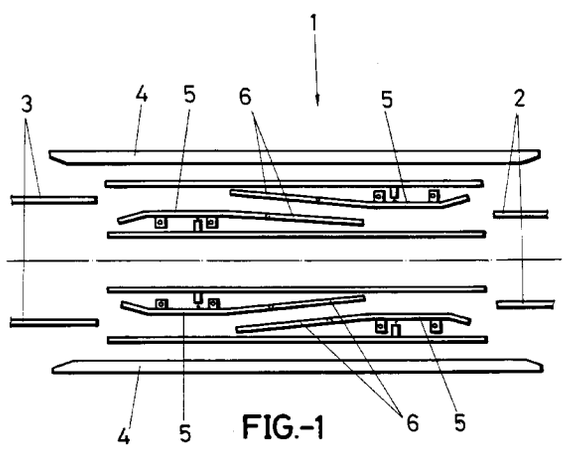


FIG.-1

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BACKGROUND OF THE INVENTION

The present description refers to a Patent of Invention concerning a fixed installation for changing the railway gage, which is intended for allowing to automatically change the gap existing between the rolling wheels, adapting them to each of the two conventionally used gages.

FIELD OF THE INVENTION

This invention applies to the industry for the manufacture of railway vehicles.

RELATED ART

At present, nothing is known about a fixed installation allowing the railway vehicles to automatically change the gap between the rolling wheels used by the train known as TALGO.

Nevertheless, there are, at present, different installations designed for this purpose, having special features and configurations, to be used on the wheels of conventional rollings which, in general, are utilized by all railway vehicles in an undiscriminatory manner, save, of course, the exceptions existing in some type of railway vehicle having specific wheels and for a specific use.

Nevertheless, with regard to the trains known as Talgo, nothing is known about the existence of an installation allowing the gage to be changed, and being constituted and positioned in a fixed way.

The obvious solution to this problem would be to rely on a fixed installation allowing to automatically modify the gap between the rolling wheels of the trains Talgo, adapting them conveniently to each of the two gages.

DESCRIPTION OF THE INVENTION

A fixed installation for changing the railway gage, as proposed by the invention, constitutes an obvious solution to the present problems on this matter.

In a more definite way, the fixed installation for changing the gage, which is the object of this invention, is constituted from its positioning on the upper part of a large block of reinforced concrete, which is hollow inside, a series of elements necessary to obtain the wheel translation and their subsequent locking being supported on this block.

At the same time, this block transmits the vertical load corresponding to the vehicle weigth to the ground, when the vehicle is passing over the installation and, in turn, the forces generated in the gage change operation.

The fixed installation for changing the gage has, at the end corresponding to the international gage, rails descending slightly until being later interrupted.

Before this interruption and transversely overlapping these rolling rails, there are arranged two sliding and centering guide-rails, which are symmetrically located with regard to the longitudinal axis of the fixed installation.

To carry out the translation operation of the wheels from a gage to other gage, it is necessary that these wheels do not support the load, this requirement being obtained by supporting the rollings on the guide-rails by means of sliding runners located on the sides of said guide-rails.

Upon descending these rolling rails, the horizontal runners come into contact with the upper flat face of the guide-rails, the wheels being unloaded for the whole process of changing the gage.

On the descent zone of these rolling rails, there are guard rails, with which the appropiate previous centering of the rolling rails is effected.

Apart from these horizontal runners, there are other vertical runners in contact with the inner flat of the guide-rails, these ensuring the centering of the rollings during the gage change - operation.

Both the horizontal and vertical runners and the sliding runners are made of a plastic material.

In order to reduce the friction coefficient thereof with the guide-rail steel, they are water lubricated.

This lubrication is obtained by wetting the guide-rails by means of an installation located outside these ones, said installation being fitted with multiple diffusors.

The ends of the guide-rails are fitted with additional parts, the function of which is to obtain an additional centering of the rolling.

The immobility of the rolling assemblies, i.e., wheel, axle and a pair of bearings, when the rolling is in any of the two gages, is ensured by a double locking of the latch pindles.

In view of the above-mentioned description, the fixed installation has four unlocking-locking guides, which are symmetrically arranged with regard to the longitudinal axis of the fixed installation.

Once the rolling has been supported on the guide-rails and it continues to advance through the fixed installation, the lower bridges of the locking latches enter the guides and the - latches descend, these latches being unlocked at the center part of the guides, where their vertical profile is horizontal.

Owing to the fact that the friction parts of the latch bridges are also made of a plastic material, they are also water lubricated through appropiate installations which are located on each of the upper parts of these unlocking-locking guide cores.

In the hypothetic case that a locking latch would arrive at the fixed installation under its nominal height, the ends of all guides incorporate a safety fixture.

Apart from this safety fixture, out of the fixed installation at both access ways thereto, and about 38

m from each of its - ends, a devide for detecting the latch height has been incorporated.

In the possible case, although of course very unlikely, that any of the latches would descend below its nominal height, and in order that the rolling does not enter the fixed installation, this device, by additionally producing the corresponding acoustic or semaphoric signal, would give a relative order to the operator to immediately stop the train.

During the latch unlocking process, the resilient portion of the wheel translation guides entering the fixed installation thru the international gage side, comes into contact with the outer face of the rims thereof, and the pressure exerted on the wheels helps the latch unlocking operation.

Subsequently, and as the rolling advances through the fixed installation, the wheels lose their contact with the resilient portion of the translation guides on the international gage side, and immediately they come into contact with the rigid portion of the translation guides on the gage side as used by RENFE.

During the contact of the wheels with this rigid portion of the translation guides on the RENFE's gage side, the latches are unlocked and the wheels are transferred to the gage of the type used by RENFE.

Then, the wheels are still in contact with the resilient portion of the translation guides on the side of the type of gage as used by RENFE, and the latch guides pressure them upwardly, locking them.

The pressure exerted on the resilient portion of the translation guides facilitates the latch locking.

In the hypothetic case that a wheel does not carry out its total translation until being placed in the correct position, and in order to avoid this can surmont the resilient portion of the translation guides and damage it, there is provided an inclinate plane at the upper part of these guides.

Once the translation process of the rolling assemblies ended, these assemblies are locked in a position corresponding to the gage used by RENFE.

At the ends of the latch unlocking guides, height sensors are mounted, which check if any latch is not correctly locked, owing, for example, to the fact that a rolling assembly has not been fully transferred to its correct position.

These sensors, the same as those controlling the correct position of latches before passing over the fixed installation, would drive the acoustic or semaphoric signal for stopping the train.

Lastly, as the rolling continues to advance through the fixed installation, there is a point in which the wheels come into contact with the upward rails of the gage type as used by RENFE, and the sliping and centering runners lose their contact with the guide-rails, and the rolling is ready to roll over the track of this type of gage.

The reverse process of passing from a gage of the type used by RENFE to the gage as internationally used, is carried out in a fully similar way.

It must be pointed out that the gap between the inner faces of the wheels of the TALGO rollings, capable of being displaceable in both gages, i.e. between the gage used by RENFE and the international gage, should be included within limits of 1593 +/- 3 mm and 1360 +/- 3 mm.

The positioning of the rolling assemblies between both gages, in order to maintain a gap between wheels within these limits, is ensured by its mounting technique and the blocking system by means of the locking latches; now then,when carrying out, in the fixed installation, the displacements of these assemblies to position the wheels in the corresponding gage, the following points are to be followed:

- Do not carry ouy violently the unloading operation of the wheels and the subsequent loading of same, bearing in mind that the wheel diameters decrease along their lives.
- During the passing of the rolling through the fixed installation, this is to be always closed and not subject to vertical or oscillating motions.
- The entering of the locking latch bridges into their respective guides must be smooth, and the vertical displacements imparted by these guides to the latches must ensure their correct unlocking and subsequent locking.
- The wheel translation guides must ensure a correct motion thereof, by placing them in the precise position corresponding to the gage in question.

In order to meet these requirements, it is necessary that the elements of the fixed installation meet the following positioning conditions:

- The RENFE gage rails and the international gage rails interrumped at the two ends of the fixed installation must descend 45 +/- 4 mm, with regard to the elevation of both tracks, a length of 1500 mm.
- The upper part of the sliding and centering guide-rails in all its length must be a relative height in relation to the rolling rails of 319 +/- 1 mm, and the separation between inner faces all along the length must be 2570 +/- 2 mm.

It must be taken an exhaustive care with regard the relative position and its corresponding tolerances, both in vertical and transverse direction, in relation to the latch unlocking and locking guides as regards the slipping and centering guide-rails.

The dimensions and tolerances of the wheel translation guides, as well as their position with regard to the longitudinal geometric axis of the railway installation, must be also exhaustively taken care of.

- In order to get the correct translation of the wheels, ensuring that the wheels have attained

their accurate positions, it is necessary that the reaction spring of each of the resilient portions has a decompression of 210 kg, and that its reaction - force is included within a prefixed scale of values.

- To obtain low friction coefficients between runners and slides of plastic material and the steel surfaces of the sliding and centering guides, as well as of the unlocking guide heads, the rugosity of these steel surfaces must be less than .8 as per UNE 1-037 Standard.

Finally, in order to obtain the positioning requirements and their previously mentioned tolerances, it is necessary not only to get remarkable qualities in the machining of parts, but also to carry out a subsequent high precision assembly, bearing in mind the dimensioning of the parts and that the anchoring of same must be made in a concrete civil work.

This assembly is remarkably tough, since it requires to use a large amount of supplements and a very detailed checking simultaneous with said assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to complement this description and to aid to a better understanding of the features of this invention, the accompanying drawings, which are a part of same, show, in an illustrative and non limitative manner, the following:

Figure 1 shows a diagramatic plan view of the fixed installation for changing the railway gage, which is the object of the invention.

Figure 2 shows a detailed plan view of the installation which is the object of the invention.

Figure 3 shows an elevational side view, properly sectioned, along the line A-B of the object represented in Figure 2.

Figure 4 shows a detailed plan view of the installation illustrated in the previous Figures.

Figure 5 shows an end elevational view seen by C/D, of the object illustrated in Figures 2 and 3, seen from the zone in which the pit is incorporated.

Figure 6 shows an end elevational view, properly sectioned, of the installation zone shown in Figures 2 and 3, without pit.

Figure 7 shows an end elevational view, properly sectioned, seen by G/H.

Figure 8 shows a new detail of the installation seen by I.

Figure 9 shows again other detail of the installation which is the objet of the invention, seen by J-K.

Figure 10 shows an end elevational view, properly sectioned, seen by L-M.

Figure 11 shows a diagramatic plan view of the resilient guide incorporate into the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In view of these Figures, it can be seen that the installation 1 is constituted by rails 2 having the international gage, located on one of the sides, presenting on the other side or opposed end rails 3 having the gage as used by RENFE.

The installation has, also, guide-rails 4 for the centering and sliding operation, disposing of a resilient zone on the translation guide 5 and a rigid zone on the translation guides 6.

The installation illustrated in Figure 2 has a complementary installation 7 composed of rails and guard rails, relying on sliding guides 8 and 8 , as well as a resilient guide 9 and 9', having a reinforced concrete assembly 10.

Also, the installation shown in Figure 2 has an outer guiding assembly 11 for the unlocking operation, and an installation 12 for the sliding operation, as well as centering guides 13, all them located in a general pit.

The installation disposes of an outer support 17, and an assembly composed of a support 22, a nut 21, a screwed cylinder 20 and a nut 19.

In Figure 7, it can be seen that the installation disposes of an outer unlocking guide 14 and an upper pit framewoarh 15, while Figure 8 shows a fixture 16.

Figure 10 shows a moving armature 18.

Figure 11 represents a resilient guide 9.

In synthesis, this installation is designed to be applied to railway vehicles disposing of bogies of two wheels of independent turn, in which each wheel is mounted on an independent axle, which is fitted, in turn, with bearings at both ends, so forming the appropiate rolling assembly, thereby said bogies allow the rolling assemblies to be transversely and symmetrically translated, the bearing boxes being held in the correct position by the action of fixed stops and by using a simple latch.

The essential purpose of this installation is to allow to change the position of the rolling assemblies, enabling the train to follow its route over a railway network disposing of a different gage.

The gage changing operation is automatically performed when the train passes over the fixed installation, this operation being perfectly reversible and the rolling assemblies returning to their initial position if the train passes again over said installation in opposed direction.

The fixed installation has dual transition guard rails, which at one of their ends, are adapted to the appropiate gage used as international gage, while, at the other end, they are adapted to the gage as used by RENFE, so that they can guide the wheel from one to other position.

Likewise, the installation has supporting runners which are parallel to the gage, being designed to help

the bogie frame to rest on them when the train runs, and to facilitate the performance of the whole installation, although, in this point, their function is essentially and specifically to make possible that the wheels can be incorporated into the appropiate dimensions, so constituting, consequently, a step or stage of function.

Also, the installation relies on extracting guides, which are parallel to the track axis, and are inserted into a bridge located on the locking device, their function being to lock and unlock the latches.

The extracting guides are arranged so that theirs ends are located at a fixed height so allowing to be inserted by the lower suppats of the locking device bridges, progressively descending towards their center part, which is maintained at a steady height during the path necessary to allow the rolling assemblies to be laterally displaced, as during this path the mentioned latches are to be held in their lower unlocking position.

In synthesis, to change its gap between wheels, each bogie carries out the following process:

The train enters the transition station coming from a track having a large gage, and any bogie belonging to the train, located at the entry of the fixed installation, is driven from the runners having an upper upward face.

The horizontal supports of the bogie frame are located at the same vertical than the runners.

The bogie continues to run on the rails until arriving at a fixed point, in which the supports come into contact with the runners, and the bogie starts to ascend, their supports sliding on the runners.

The wheels detach from the rails, so being unloaded, and the rolling assemblies remain supported, thru their lugs, by the guides.

The runner slope is so fixed that it is smooth enough for the bogie frame to tilt and rest on the runners all along the support length.

The height differential of a runner between two planes A and B is defined by the addition of the variation to be presumable borne because the use by the wheel spoke, and the descent produced at the bearing boxes from a running position to a sliding position, and the minimal gap which is desired to have with the wheel having a maximum diameter between the periphery thereof and the rail.

On arriving at plane B, the bogie attains its maximum height and it maintains this height until arriving at the other plane, since the runner surface will be horizontal between the planes in question.

At the mentioned plane B, the gage rails are eliminated from the gage A, since they are not necessary because the wheels are not already supported by the rails, and there the extracting guide start, which enter through the locking device bridges.

Said extracting guides descend gradually, so impelling the latches consequently to be unlocked until arriving at a point in which they are fully unlocked.

By means of guard rails guiding transversely the wheel, this is held in position even after the unlocking operation.

Later, the outer transition rails will act, displacing laterally the rolling assemblies until arriving at a stop position corres p onding to the other gage.

During the transition path, only the outer guard rails will act in the case of passing from a larger gage to a smaller gage, or only the inner ones in the case of passing from a smaller gage to a larger gage, so that there is no possibility that the wheel becomes inserted between them, since they are adequately apart.

These guard rails are located at a greater height than the rails, in order to compensate for the elevation undergone by the wheels and the difference of rim diameter and the opposed part of the wheel.

During the path, the guides are horizontal, having the function of holding the latches unlocked, and from a definite point the rails are not already exist, and the guides start to ascend, pushing the locking device upward until a fixed point, in which these guides end, and locking device and the bearing boxes are again laterally locked in a position corresponding to the smaller gage.

The guard rails having a smaller gage extend until a fixed point parallel to the rails, in order to laterally guide the wheels by the part opposed to the rim, so impeding their possible sideways displacement before producing the locking.

During the path with the bearing boxes unlocked, it is totally necessary to laterally guide the bogie frame in order to hold it centered with the longitudinal axis of the track.

This operation is attained by means of side guides which are a part of the runner, said guides starting at a fixed point and, gradually, they reduce the play between runner and bogie frame, until this play is adjusted and maintains these conditions until a point in which the play starts to gradually increase, until other fixed point in which the side guides disappear.

Later, the descent of the runners start, and the bogie frame descends gradually until the wheels rest on the rails and the bogie frame rest on the upper faces of the bearing boxes.

The runners end and leave the bogie ready to continue to run over the network having the new gage.

Of course, and successively, all the train axles undergo this same process on passing over the fixed installation.

Also, it is contemplated the possibility of maintaining a fixed installation wherein the transition guard rails do not exist, displacing laterally the wheels, the guide being a groove formed on the same runner.

In this variant, at the front of the outer bearing boxes there are mounted supports fitted with bushings having vertical appendices the lower end of which is inserted into the guide during the change operation.

Ths guides are parallel to the track axis, and later they approach one another a distance equivalent to the difference of gages, and starting from this point it is again parallel to the track axis.

When the train arrives at the fixed installation coming from a network having a greater gage, the bushing appendices are inserted into the guides, so making easy the entry into them by the surfaces, and the lifting operations of the bogie and unlocking follow one another on the same planes as in the previous case, in which is contemplated the existence of guard rails.

When each axle arrives at the fixed point, the unlocking has been already produced, and the appendix slides inside the groove, and it is forced to displace towards the track axis, pushing consequently the whole rolling assembly until placing the wheels at the distance corresponding to the smaller gage.

Said appendices are still inserted through the parallel zone of the guides, so impeding the bearing boxes to separate from the stop position before the locking operation.

An important advantage of this arrangement is that the necessary force to laterally displace the rolling assembly is applied directly to the appendix on the same horizontal plane as the friction force opposing to said displacement.

An additional improvement in this variant is obtained through a resilient mounting of the bushing, placing it on the bearing box.

A rubber ring-shaped part interposed between the bushing and the fixed part of the support, which is common to the bearing box, makes it possible said appendix to rotate about a longitudinal horizontal axle, taking a tilted position.

Nevertheless, if it is preferred to harden the bushing resilience, when the appendix arrives at certain angle, it is possible to resort to resilient stops, through which the installation tolerances can be extended in relation to the relative position of appendices and guides.

The invention has an additional advantage defined by laterally displacing the guides some centimeters on the appropiate path, so generating a force maintaining the bearing boxes squeezed against the bogie frame stop, so making easy the locking and unlocking operations since the bearing boxes do not exert any force in the opposed direction, i.e., against the latches themselves.

When passing from the smaller gage to the larger gage, the steps follow one another according to the same above-mentioned process, excepting that the train will pass over the same installation following a reverse sense, notwithstanding the sense followed by the train, since the system operates indifferently, no matter whether the head axle or the tail axle is the first one passing through the fixed installation.

The ends of the guides are slightly below the maximum height attained by these guides so that the position of the latch bridge when leaving the installation corresponds to an intermediate height.

So, when the bridges enter again the installation, they do not rub on said guides until a part of same are inserted inside.

If the vertical force retaining the locking device exerted by springs has been completed with the additional magnetic retainers, the maximum height of the guides has been foreseen in order to ensure that both the fixed and moving parts of the magnetic retainers contact intimately.

One of these parts has been flexibly disassembled in order to obviate that the bogie becomes suspended from the extracting guides instead of from the runners.

Both in one variant and in the other variant, to unload the wheels it is necessary to lift the runner on the rails, but this height variation is always relative, so that there is a possibility that the runner be horizontal along its length, and that the rails descend at their ends adjacent to the installation In both cases, the vertical layout of the guard rail extracting guides, or of the guides transversely displacing the wheels is made according to the height of the horizontal section of runner.

The installation, which is the object of the present invention, has other additional advantages, such as the existence of more ample tolerances, since the possible dimensional differences are absorbed by the support resilience, securing also the non existence of any type of transverse force on the latch in the moment of unlocking, due to the fact that the resilient - support is pushing the rolling assemblies against the fixed stop.

A fixed stop, to be used in the event the spring breaks accidentaly, impedes the guard rail from yielding even more to what is pre-established, and thus it is sure a correct operation, even in the case that the spring breaks, although. it is evident, in this case, that the resilient guard rail does not carry the wheel until its limit position, but it can bring it near enough for the latch, the ends of which will be formed by inclined faces, shaped like a pyramid trunk, to place, in its upward motion, the rolling assembly in its correct position.

The fixed guard rails are not rigidly mounted on the fixed installation, but they are mounted with a relative elasticity, in order to reduce the impact when the wheels rest on them.

Nevertheless, the springs are generally precompressed, this precompression being dimensioned to have the required force on the resilient guard rail with-

out the need to use springs having greater characteristics.

An additional improvement consists of transversely centering the bogie, with which, before the latch bridge houses in the unlocking guide , the bogie becomes perfectly centered.

Assuming that the train arrives at the transition station coming from a larger gage, and considering any bogie belonging to the train located at the entrance of the fixed installation, the runners begin upto the second plane, these runners having a lateral transversely inclined face, so obtaining to laterally center the bogie.

Of course, between planes there is a gradual spacing out between the upper faces of the rails and the runners, preferably by rail descent, so achieving that the bogie, at its displacement, rests, through supports, on the runners, whilst the wheels stop contacting the rails.

The rolling assemblies will rest on the bogie frame by means of lugs located on the respective bearing boxes.

On the second plane, the rails are suppressed, as they are not necessary since the wheels are not already resting on same, and, instead, the extracting guides begin to gradually descend until the second plane, forcing the locking latches to unlock progressively the rolling assemblies, which is fully obtained on the third plane.

Also on the second plane, the resilient guard rails begin to be driven by the action of the springs, pivoting on the vertical axle compressing the bearing boxes against the fixed stops of the bogie frame.

Between transverse planes, there are located fixed guard rails, the extracting guides being horizontal along this lenght and holding the latches unlocked when the bogie slides, which allows the rolling assemblies to be transversaly and gradually displaced by the action on the wheels of the fixed guard rails.

Later, the guides begin to gradually ascend, pushing upward the locking device until ending these guides, and the bearing boxes are fully locked laterally in the position corresponding to the smaller gage.

During these operations and path, the outer resilient guard rails compress the bearing boxes through the wheels against fixed stops of the bogie frame corresponding to the new gage.

Afterwards, a progressive approach of the upper faces of runners and rails is effected, and the wheels gradually approache the rails until resting on them, and the bogie frame will rest on the upper curved surfaces of the bearing boxes.

On finishing the runner action, the bogie will be ready to continue to run over the network of the new gage, and all bogies will undergo successively this same process when passing over the fixed installation which is the object of the invention.

When changing from a smaller gage to the larger gage, such as mentioned in the above descriptions, the operations follow one another according to the same mentioned process, excepting only that the train will pass over the same installation in a reverse direction, the sense followed by the train being totally indifferent, since, as Previously said, the system works uniformly, whether the head axle or the tail axle enters the first the fixed installation.

It is not considered necessary to extend more this description for an expert in the art to understand the scope of the invention and the advantages derived from it.

The materials, shape, size and arrangements of the components are open to variation, provided that it does not imply any alteration to the essence of the invention.

The terms under which this specification has been described should be taken in an ample and non limitative sense.

Claims

1.- A fixed installation for changing the railway gage, characterized in that it is constituted from a symmetric arrangement in relation to a vertical and axial plane which is common to two end lengths of tracks of different gap between rails and located in an intermediate space and adjacent to the rail ends; in which guiding and supporting elements are installed including sliding surfaces formed by runners, on which different sliding and supporting means are supported which are common to bogies in order that these means, when a train passes on the installation, raise gradually in relation to the rails until attaining a fixed level wherein the wheels lose their contact with said rails and which guides have an inner lateral shape which is appropiate to guide at the same time transversely said bogies, and relying on guiding means or guard rails for transversely guiding the wheels when these wheels lose their contact with the respective rails located in the space existing between the ends of the rolling rails of the different gages, which guides or guard rails are in an inclined position in relation to the longitudinal axis of tracks, in order that, once the wheels have been released, they move transversely from a position corresponding to a gage to another gage, relying also on means for driving blocking means arranged on the bogies fixing the transverse positions of bearing boxes and the brake for each wheel, said driving means including two longitudinal parallel guides arranged on both sides of the transverse guiding guard rails of wheels, presenting means for hooking the unblocking device compelling to a gradual motion to drive the blocking device in order to initiate the unblocking process at one end and, at the other end, to determinate a new blocking, thus the process being reversible and independent of the

train traffic sense.

2.- A fixed installation for changing the railway gage, according to claim 1, characterized in that the sliding runners of bogies are defined as fixed elements, parallel and symmetrical arranged in relation to the mean vertical longitudinal plane of tracks, displaying, on their upper part, a horizontal plane all along their length when the rails of both gages have, at their ends, downward inclined planes, or displaying, on their upper plane, a horizontal middle part and two downward inclined parts towards the respective ends when the facing ends of the rails are horizontal, the level of the runner horizontal plane being adequate so that the wheels, bearing in mind possible wears on wheels and other constitutive elements, lose their contact with the tracks since they rest on said supporting part of bogies, and the level and shape of the inclined ends of runners or rails being sufficient so that, under any circumstance, the sliding surfaces of respective runners come smoothly into contact with the bogie supports.

3.- A fixed installation for changing the railway gage, according to the preceding claims, characterized in that the sliding runners of the bogies have, at their inner faces and on the upper part of same, a protruding shape including a middle part parallel to the vertical longitudinal plane of the guides and two end divergent inclined parts towards the ends, with regard to said plane, constituting guides to impede the transverse motion of the respective bogies when these are resting on the runners.

4.- A fixed installation for changing the railway gage, according to the preceding claims, characterized in that is has guides for the transverse motion of the wheels in order to pass them through a gage to other gage. Said guides are formed, on each side, by pairs of guard rails having a middle parallel part having an inclinaticnwhich is appropiate to allow the rolling assembly to pass from a position to other, and relying, at each element of each pair, on lengths which are parallel to each rail, arranged so that the innet guard rail begins at the end and from the other inner part of the respective rail of the track having the larger gage, and the outer guard rail begins at the end and from the outer part of the respective track having the smaller gage, so that, according to the sense of the train run, the distance between wheels decreases or increases when they are guided through the outer or inner rail.

5.- A fixed installation for changing the railway gage, according to the preceding claims, characterized in that it has extracting means for driving the transverse blocking device of the bearing boxes and brake of each wheel, said means being formed, on each rail, by parallel guides which are arranged between the ends of the rolling tracks having different gages on both sides pf the transverse guiding guard rails of the wheels, said extracting guides being formed by a profile adopting a T-shape, which includes, at its middle part, a horizontal flat part coincidental, in length, with the vertical flat middle part, and end parts inclined upward towards the end, in which guides driving means for said devices blocking the wheels are housed, adequately adapted so that the guides are housed, thru their upper part, in same, in such a way that they cause, in the mentioned driving means as the train advances, a downward vertical displacement, to give rise to their unblocking, and after effecting a run without any displacement, a second vertical upward displacement to give rise to their returning to the blocking position, said driving being, consequently, identical in any sense of the run.

6.- A fixed installation for changing the railway gage, according to the preceding claims, characterized in that the sliding runners for supporting the bogies have, on their upper face, a guide having an adequate width comprising a length which is parallel to the longitudinal axis of the track at each end, and spaced apart a same distance from the respective rail of the corresponding track, and an inclined part to link between both parallel lengths, the projection of which is coincidental with the horizontal middle part of the extracting guides with which cooperate means arranged in the respective bearing assemblies of each wheel, in order to obtain a displacement of each assembly to pass from a gage to other.

7.- A fixed installation for changing the railway gage, according to the preceding claims, characterized in that the guard rails for transversely guiding the wheels are constituted by two parts, one fixed to the installation which markedly coincides with the inclined length of guard rails, and one configured as an extension for the former, which coincides with the length parallel to the track axis, this latter being articulated at its most proximal end to the transverse middle plane of the installation and being laterally elastic, by means of a spring which can be either precompressed or not, and which makes the guard rail to push the wheel when passing over this zone in a reverse sense to that of displacement imposed by the inclined length at the entry to the fixed installation, and in the same sense at the exit.

8.- A fixed installation for changing the railway gage, according to claim 7, characterized in that each resilient guard rail is fitted with a stop limiting its lateral displacement in the - sense imposed by the action of the resilient device.

9.- A fixed installation for changing the railway gage, according to claim 7, characterized in that each resilient guard rail is fitted with a stop delimiting its lateral displacement in a sense opposed to that imposed by the action of its resilient device, until a predetermined limit marked by the projection on a horizontal plane of each inclined face of the unlocking latches.

10.- A fixed installation for changing the railway

gage, according to claims 7, 8 and 9, characterized in that the sliding runners of the bogies have, at their inner faces and on the upper part of same, a protruding configuration including a middle part parallel to the vertical longitudinal plane of the installation, and two end inclined parts which are divergent towards the ends, in relation to said plane, which constitute transverse guides, thereby centering the bogies before the unlocking guides enter through the bridges of the corresponding latches.

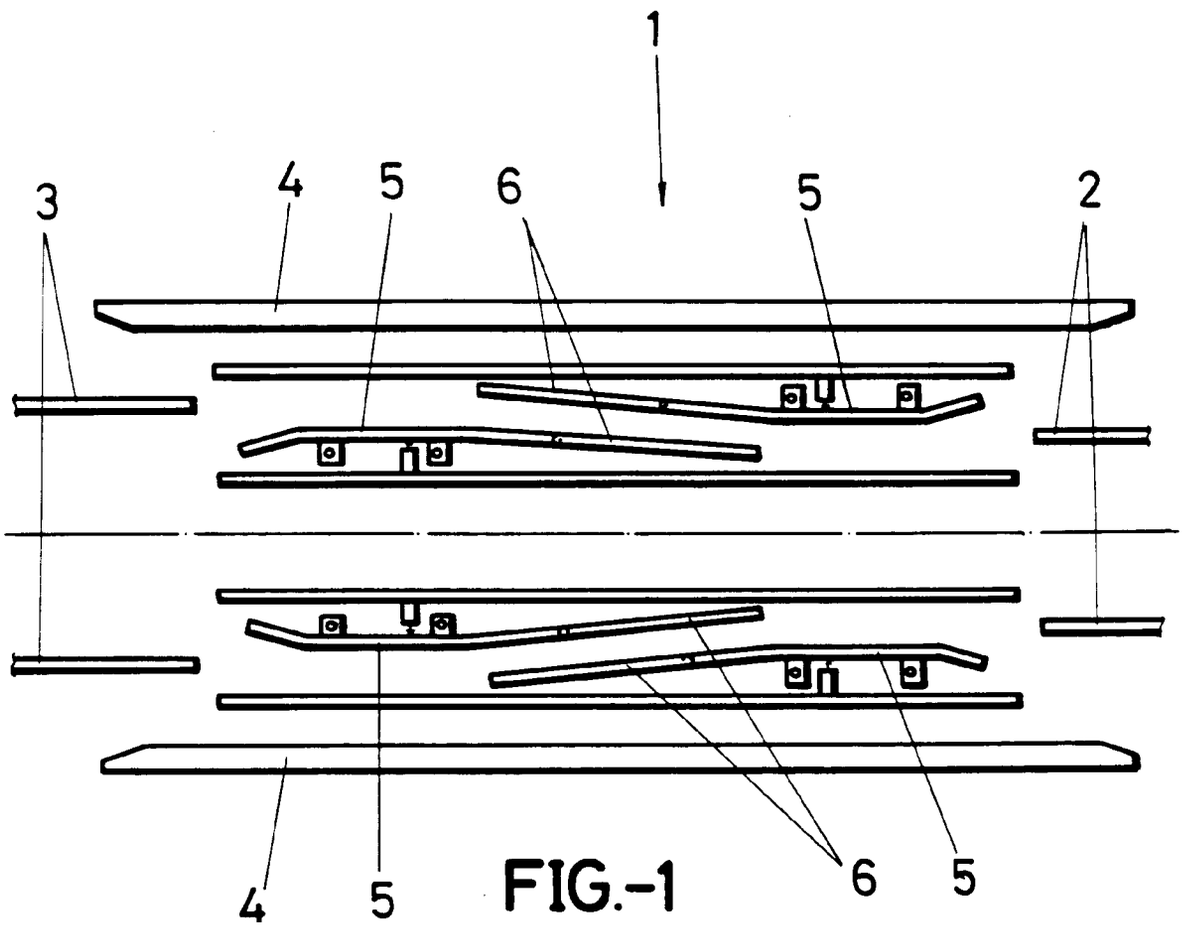


FIG.-1

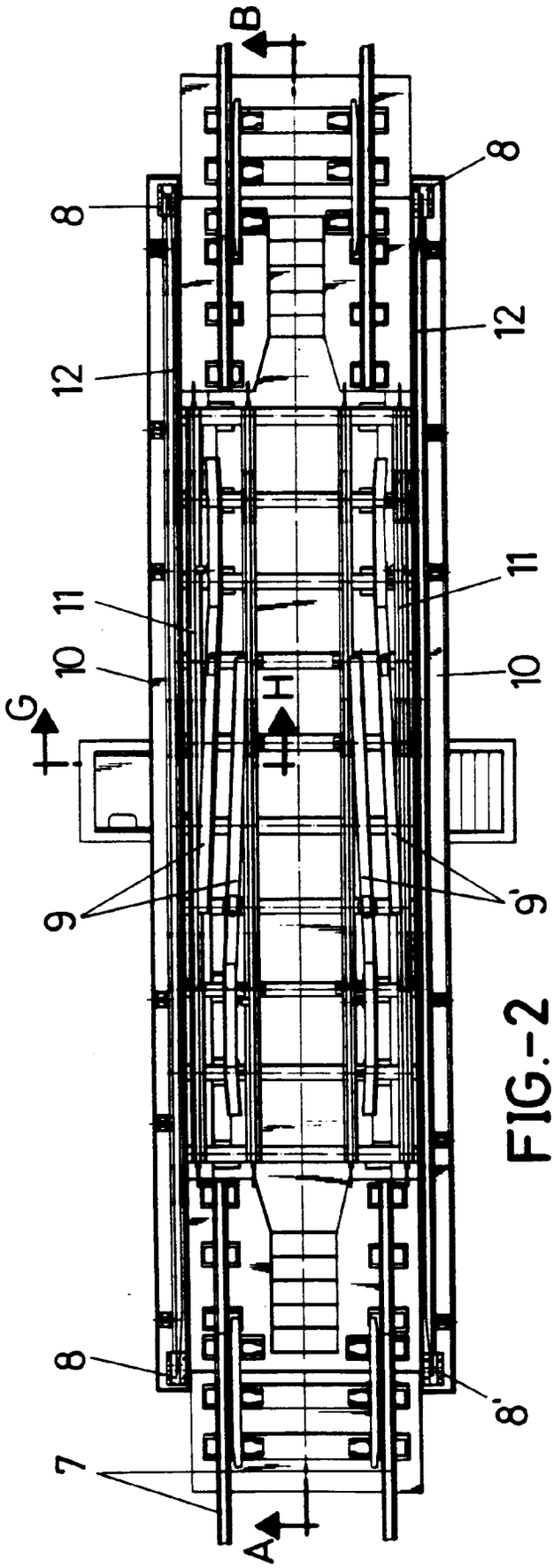


FIG.-2

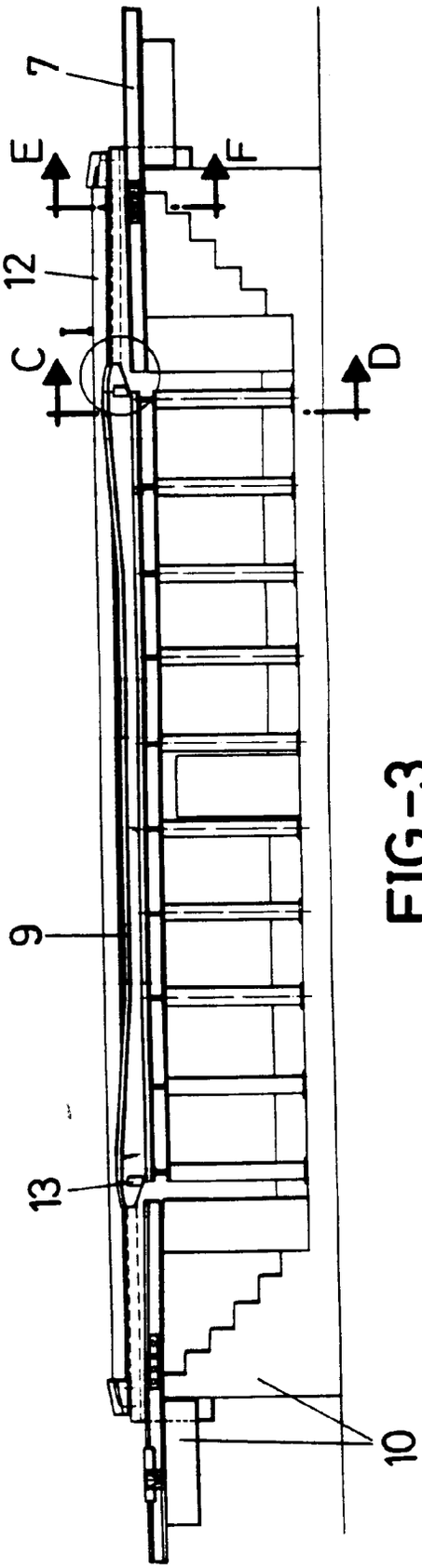


FIG.-3
A-B

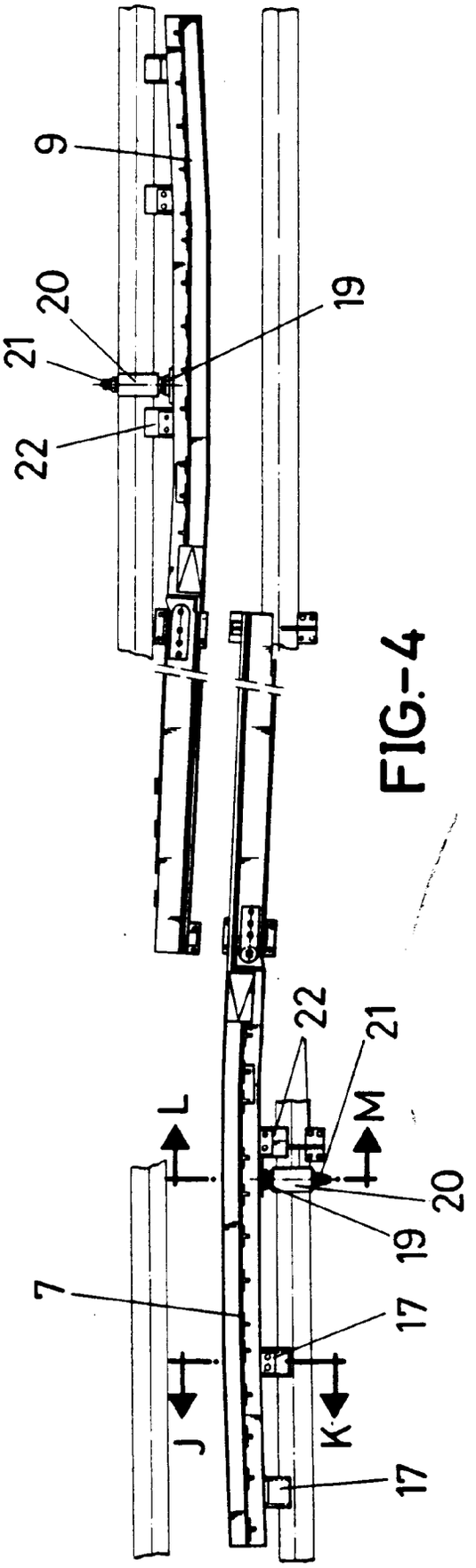


FIG-4

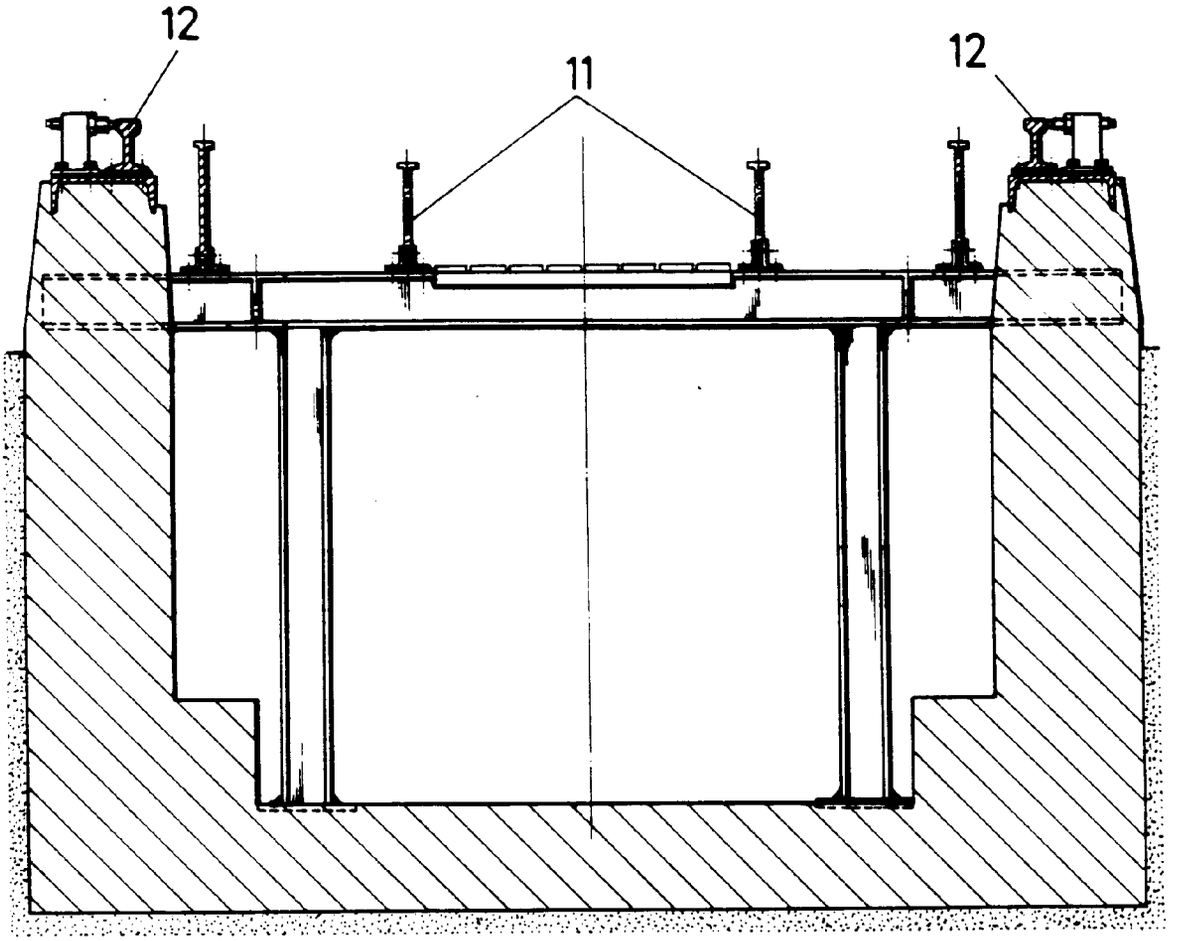


FIG.-5
C-D

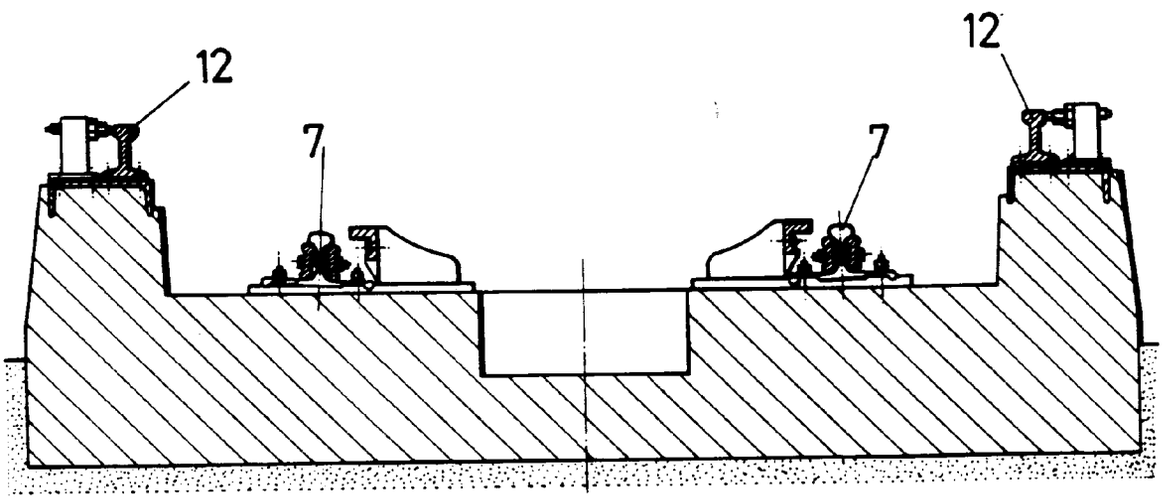


FIG.-6
E-F

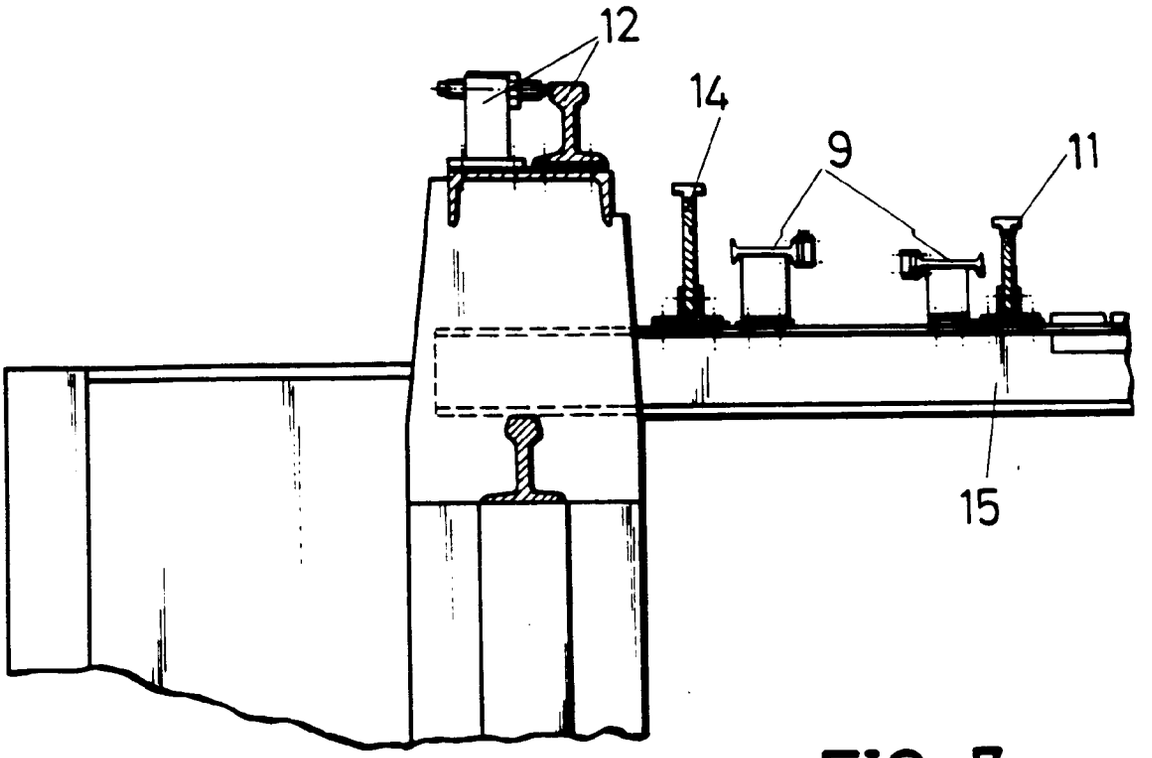


FIG.-7
G-H

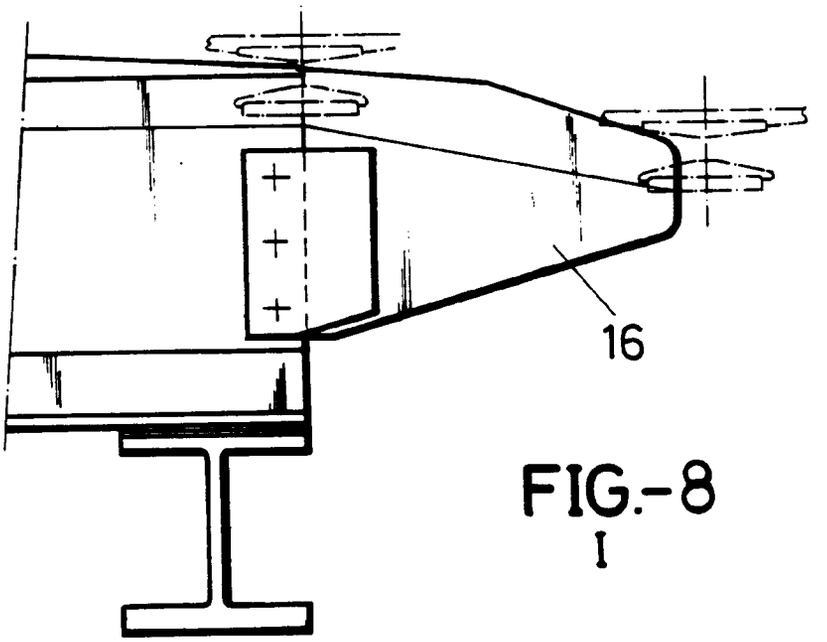


FIG.-8
I

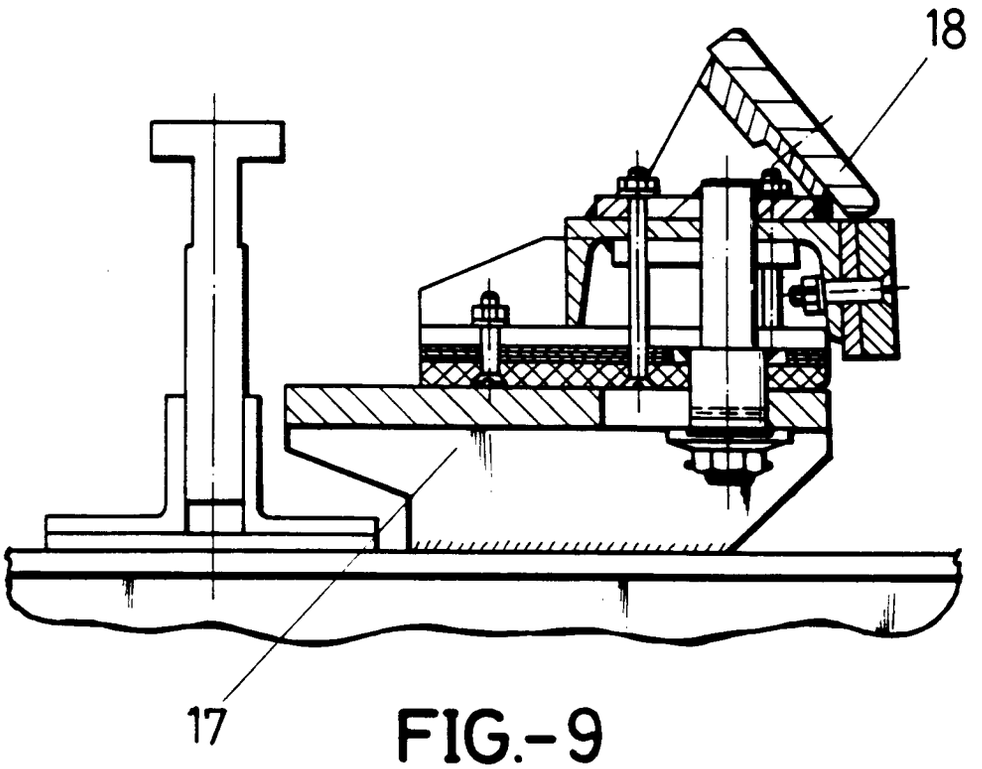


FIG.-9
J-K

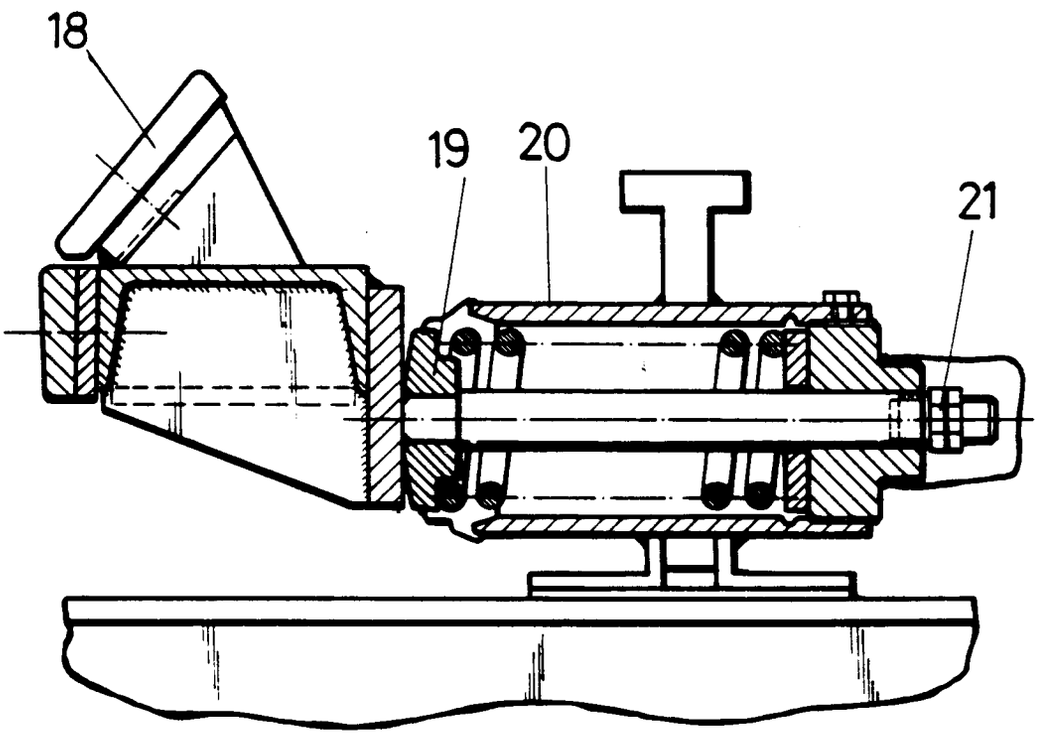


FIG.-10
L-M

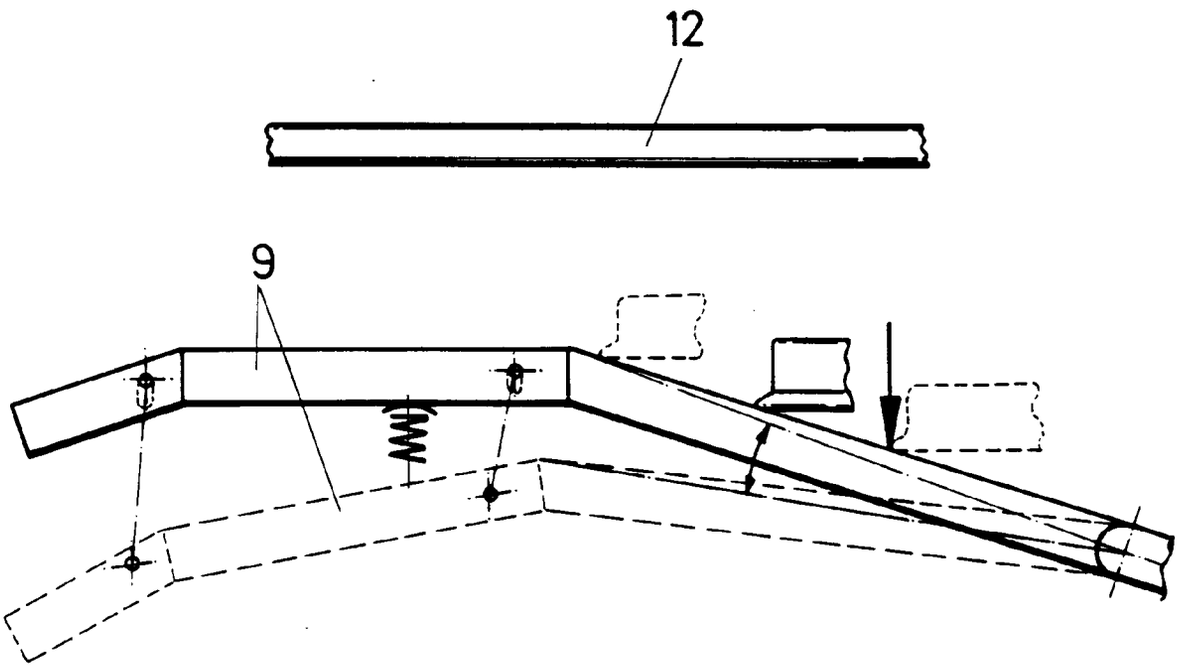


FIG.-11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 50 0014

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	US-A-4 942 826 (ERICKSON)		E01B26/00

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

E01B
B61D
B61F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31 May 1994	Tellefsen, J

CATEGORY OF CITED DOCUMENTS

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