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(54) **SIMPLE GUARDRAIL LOCKING DEVICE**

(57) The utility model relates to a simple guardrail locking device, which comprises a clamping plate, a press plate, a bottom plate, a connecting rod and fasteners. The bottom plate is set horizontally, and there is an adjusting part on the bottom plate; The clamping plate and the clamping plate are arranged in parallel or inclined to extend in opposite direction. The clamping plate and the clamping plate are arranged on the bottom plate and locked on two opposite sides of the rail respectively through fasteners. At least one of the clamping plate and the clamping plate is detachable and mounted on the adjusting part of the bottom plate. The adjusting part adjusts the distance between the pressing plate and the clamping plate. Simple guardrail locking device of the present invention can be applied to a variety of sizes of tracks, high flexibility, strong practicability, and greatly saves the use of material, in addition, the invention makes full use of the rails at the bottom of the gap with simple installation guardrail locking device, on the premise of not affect the normal use of the tracks, the locking device installation is more simple and stable.

Text in the drawings:

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

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Description

Technical field

[0001] The invention relates to a locking device, in particular to a simple locking device of a safety guardrail on a railway track.

Technical background

[0002] Along with the development of science and technology, the progress of The Times, the domestic and foreign railway development is rapid, which has given rise to a lot of form a complete set of rail construction, with the increase of railway construction, the construction safety has received wide attention of railway construction, this needs a kind of railway construction in protective safety barrier, to remind and avoid other than construction personnel or vehicles to enter the construction site.

[0003] Please refer to figure 1, usually for the existing security fence 10 lock module 11 lock on 30 tracks, lock module 11 through down regulating the location of the screw nut on 12, 13, the moving parts move down and forced the strut of 14 15 to 30 track direction, moving forward at the bottom of the strut 15 bolster a 16, 16 support bar along the railway within 30 of the inclined plane moving up, until the ends of the up and down that supports 16 clamping respectively in 30 tracks and two inside surface, thus will lock module 11 lock on 30 tracks.

[0004] It can be seen from the above that the length of the support piece 16 and the distance between the upper and lower inner sides of the rail line 30 need to be matched. If the support piece 16 is too long or too short, it cannot be stuck on the rail line 30, thus leading to the locking module 11 of a specification that can only be locked on the rail line that matches it. However, the existing 30 tracks up and down the height between the two inner side is not a fixed value, it can differ according to road condition and is set to different values, and the current lock module 11 does not meet the requirements of different size, the need to customize a variety of different specifications according to the height of 30 different tracks of the clamping piece, waste a great deal of production materials. In addition, each locking module weighs about 11.5 kg, and it is not easy to separate into multiple small parts, resulting in the need to consume a certain amount of physical strength in the process of handling and installation, and poor practicability.

The invention content

[0005] For this purpose, the invention aims at providing a simple guardrail locking device to solve the problem that the current locking firmware cannot meet multiple size requirements and has poor applicability.

[0006] To achieve the above purposes, the invention mainly adopts the following technical scheme:
The utility model relates to a simple guardrail locking de-

vice, which is used to install a safety guardrail on a railway track; The simple guardrail locking device comprises a clamping plate, a press plate, a bottom plate, a connecting rod and a number of fasteners. The bottom plate is arranged horizontally, and an adjusting part is arranged on the bottom plate; The card plate and press plate spacing are arranged on the bottom plate, and are locked on two opposite sides of the rail respectively through fasteners. At least one of the card plate and press plate is detachable and mounted on the adjusting part of the bottom plate. The adjusting part adjusts the distance between the clamping plate and the clamping plate, and the clamping plate and the clamping plate are arranged in a vertical parallel arrangement or a tilted extension arrangement.

[0007] Further, the card plate is connected to the bottom plate in one piece, and the press plate is dismountable to the bottom plate.

[0008] Further, the top surface of the bottom plate is provided with a plurality of mounting holes arranged side by side, and the bottom surface of the press plate is extended downward with a guide column, which is arranged in the corresponding mounting hole on the bottom plate according to the demand card.

[0009] Further, the press plate is provided with an installation part, and the installation part is provided with a limit hole that runs through the installation part along the extension direction of the press plate, and the bottom plate card is arranged in the limit hole.

[0010] Further, the bottom of the bottom plate is provided with a card slot, and the card slot extends from the bottom plate end on one side of the mounting presser plate to the direction of the card plate; The middle part of the groove bottom of the card groove is provided with a bayonet, and the bayonet runs vertically through the bottom plate.

[0011] Further, the bottom surface of the press plate is provided with a fastener, and the fastener is an inverted t-shaped arrangement, which comprises a connecting column and a limit table at the bottom end of the connecting column, the connecting column is arranged in the bayonet of the bottom plate, and the limit table card is arranged on the bottom surface of the bottom of the slot.

[0012] Further, the bottom plate and the connecting rod are respectively connected to the two ends of the pressing plate, and the card plate is an independent part.

[0013] Further, the top surface of the bottom plate is lined with a plurality of mounting holes, and the bottom surface of the card plate is provided with a guide column extending downward, which is arranged in the corresponding mounting hole according to the demand card.

[0014] Further, the fastener part is provided with an installation part, and the installation part is provided with a limit hole running through the installation part along the direction of the bottom plate extension, and the bottom plate card is provided in the limit hole.

[0015] Further, the bottom of the bottom plate is provided with a card groove, and the middle of the slot bottom

of the card groove is provided with a bayonet, and the bottom surface of the pressing plate is provided with a buckle, and the buckle is arranged through the bayonet and on the bottom surface of the card groove.

[0016] To sum up, the simple guardrail locking device of the invention is provided by setting a press plate, a bottom plate, a clamping plate and a connecting rod. The bottom plate passes through the bottom of the railway track and is connected to the press plate and the clamping plate, and the connecting rod is connected to the press plate; The clamping plate and the clamping plate are respectively locked on two opposite sides of the rail through fasteners, so that the locking of the connecting rod can be realized. The simple guardrail locking device of the invention can be used on rails of different widths, which has high activity, strong practicability and greatly saves the use of materials. In addition, because rails located in orbit pillow, and there is a big gap between the ground track, and track the clearance between the ground and does not affect the operation of railway, the present invention makes full use of the tracks at the bottom of the gap with simple installation guardrail locking device, on the premise of not affect the normal use of the tracks, the locking device installation is more simple and stable.

The appended drawings

[0017]

Figure 1 is the structure diagram of the traditional locking module.

FIG. 2 is the use state diagram of the first embodiment of the simple guardrail locking device of the invention;

FIG. 3 is the decomposition diagram of the first embodiment of the simple guardrail locking device of the invention;

FIG. 4 schematic diagram of the bottom surface of the buckle in FIG. 3;

FIG. 5 is the decomposition diagram of the second embodiment of the simple guardrail locking device of the invention;

FIG. 6 is the decomposition diagram of the third embodiment of the simple guardrail locking device of the invention;

FIG. 7 is the decomposition diagram of the fourth embodiment of the simple guardrail locking device of the invention;

FIG. 8 is another Angle diagram of mounting parts in FIG. 7;

FIG. 9 is the decomposition diagram of the fifth embodiment of the simple guardrail locking device of the invention;

FIG. 10 is the decomposition diagram of the sixth embodiment of the simple guardrail locking device of the invention.

Specific mode of implementation

[0018] In order to make the purpose, technical scheme and advantages of the invention clearer, the invention is further described in detail with the attached drawings and embodiments as follows.

[0019] As shown in FIG. 2 to FIG. 4, the first embodiment of the simple guardrail locking device provided for the invention, the simple guardrail locking device 20 is used to lock the safety guardrail 10 to the rail 30. The simple guardrail locking device 20 comprises a fastener 40 and a mounting device 50, which are respectively locked on two opposite sides of the rail 30 through fasteners 60, the mounting device 50 is mounted on the fastener 40, and the safety guardrail 10 is locked on the mounting device 50.

[0020] The card fastener 40 comprises a bottom plate 41 and a card plate 42 connected to the bottom plate 41, and the card plate 42 and the bottom plate 41 are arranged at an included Angle less than or equal to 90 degrees. The card plate 42 is provided with a screw hole 47 for locking fastener 60, and the bottom of the bottom plate 41 is provided with a card slot 43, and the card slot 43 extends from the 41 end of the bottom plate far away from the card plate in the direction of the press plate. The middle part of the groove bottom of slot 43 is provided with a bayonet 44, which runs vertically through the bottom plate 41. The bayonet 44 is arranged in a horizontal direction as long as the card slot 43, and the bottom of the card slot 43 on both sides of the bayonet 44 forms a two-limit step surface 45. A plurality of mounting holes 46 are arranged on the top surface of bottom plate 41 on both sides of the extension direction of the bayonet 44.

[0021] The mounting part 50 comprises a press plate 51 and a connecting rod 52 connected to a press plate 51, and the press plate 51 and the connecting rod 52 are arranged at an included Angle greater than or equal to 90 degrees. The middle part of pressing plate 51 is provided with mounting hole 54 for locking fastener 60, and the bottom part of pressing plate 51 is provided with two guide pillars 53 extending downward, and the guide pillars 53 are assembled in the corresponding limiting hole 46 on both sides of the bayonet.

[0022] During installation, the bottom plate 41 of the fastener 40 of the card is arranged at the bottom of the track 30, and the card plate 42 is arranged at the bottom of the track 30 and locked by fastener 60; The guide pillar 53 of the mounting piece 50 is inserted into the mounting hole 46 of the fastener piece 40, and the press plate 51 of the mounting piece 50 is locked on the other side of the track 30 through the fastener 60. The locking device in this embodiment can be adapted to track 30 of different sizes by adjusting the mounting position of guide pillar 53 on the coupler 40.

[0023] As shown in figure 5, to the present invention the guardrail locking devices in the second example, the simple guardrail locking devices and implementation of the first cases of the similar structure, including fasteners

40 and install a 50 a, described card fastener 40 and install a 50 respectively by 60 locking fasteners in 30 tracks on two relative sides, referred to install a 50 on a card in card fastener 40. The difference between this embodiment and the first embodiment is that the mounting part 50a comprises a press plate 51a, a mounting part 53a and a connecting rod 52a. The mounting part 53a is provided with a limiting hole 54a, which runs through the mounting part 53a along the extension direction of the mounting part 50a. During installation, the bottom plate 41 of the card coupler 40 is arranged in the limit hole 54a of the mounting piece 50a.

[0024] To the present invention is shown in figure 6, the barrier of locking devices in the third example, this simple guardrail locking devices and in the first example of similar structure, including fasteners 40 and 50 b, install a card fastener described 40 and install a 50 b respectively through 60 locking fasteners in 30 tracks on two relative sides, described in the installation of a 50 b card in card fastener 40. This example and the example of the difference is that install a 50 a, including 51 b and connecting rod clamp 52 b, described platen 51 b is equipped with a card attached to the clasp of 53 b, 53 b card buckle department described is an inverted T Settings, including connection column b and limit 55 b, 54 described ends column 54 b respectively connected on the platen 51 b and limit 55 b. Wherein, the width of the connecting column 54b is less than the width of the bayonet 44 on the fastener 40, and the width of the limiting station 55b is greater than the width of the bayonet 44. During installation, the connection column 54b is arranged inside the bayonet 44 of the card coupler 40, the limit station 55b is arranged inside the card slot 43 at the bottom of the card coupler 40, and the limit step 45 restricts the limit station 55b.

[0025] As shown in figure 7 and figure 8, to the present invention the guardrail locking devices in the fourth example, simple guardrail locking devices are described including card fastener 40 c and install a 50 c, described card fastener 40 c and 50 c respectively through 60 lock fastener installation pieces to 30 tracks on two relative sides, 40 c card card fastener installation on a 50 c in stated, described security fence 10 lock on the installation described a 50 c. The card fastener 40c comprises the main body and two guide posts 41c arranged on the bottom surface of the main body, and the guide posts 41c and the main body are arranged at an Angle greater than 90 degrees and less than 180 degrees. The main body is provided with a 42c screw hole for locking fastener 60.

[0026] The mounting piece 50c comprises presser 51c and the connecting rod 52c connected to both ends of presser 51c and the bottom plate 53c. The presser 51c and the bottom plate 53c are arranged at an Angle less than or equal to 90 degrees, and the connecting rod 52c is arranged parallel to the bottom plate 53c. The bottom of the bottom plate 53c is provided with a card slot 54c, which extends from the free end of the bottom plate 53c

to the direction 51c of the press plate. The middle part of the slot bottom of the card slot 54c is provided with a bayonet 55c, and the bayonet 55c is arranged in a horizontal direction equal to the length of the card slot 54c, and the bayonet 55c runs vertically through the bottom plate 53c. The clamping groove 54c on both sides of the 55c of the bayonet forms two limit step surfaces. A plurality of mounting holes 56c are arranged on the top surface of the bottom plate 53c on both sides of the extension direction of the 55c of the bayonetting.

[0027] During installation, the bottom plate 53c of the mounting part 50c is arranged through the bottom of the track 30, and the press-plate 52c card is arranged on the inside surface of the track; The guide pillar 41c card of the fastener 40c is arranged in the mounting hole 56c on the bottom plate 53c, and the main part of the fastener 40c is locked on the other side of the track 30 through the fastener 60.

[0028] As shown in FIG. 9, it is the fifth embodiment of the simple guardrail locking device of the invention. The structure of the simple guardrail locking device of the present embodiment is basically the same as that of the first embodiment, which also includes card fastener 40d and mounting piece 50c. The difference is that the 40d of the card fastener includes the 41d of the buckle and the 42d of the mounting part, and the 43d of the limiting hole is arranged on the 42d of the mounting part, and the 43d of the limiting hole runs through the 42d of the mounting part along the horizontal extension direction of the 40d of the card fastener. During installation, the bottom plate 53c of the mounting part 50c is arranged in the limit hole 43d of the card coupler 40d.

[0029] As shown in FIG. 10, it is the sixth embodiment of the simple guardrail locking device of the invention. The structure of the simple guardrail locking device of this embodiment is basically the same as that of the first embodiment, which also includes card fastener 40e and mounting piece 50c. The difference is that the card fastener 40e comprises a card plate 41e and a buckle part 42e arranged at the bottom of the card plate 41e. The buckle part 42e is an inverted t-shaped arrangement, which comprises a connection column 43e and a limit station 44e. The two ends of the connection column 43e are connected to the card plate 41e and a limit station 44e respectively. Wherein, the width of the connection column 43e is less than the width of the bayonet 55c on the mounting part 50c, and the width of the limit station 44e is greater than the width of the bayonet 55c. During installation, the connection column 43e is arranged in the bayonetage 55c of the mounting part 50c, the limit station 43e card is arranged in the card slot 54c, and the limit step limits the limit station 43e. To sum up, the simple guardrail locking device of the invention is provided by setting a press plate, a bottom plate, a clamping plate and a connecting rod. The bottom plate passes through the bottom of the railway track and is connected to the press plate and the clamping plate, and the connecting rod is connected to the press plate; The clamping plate

and the clamping plate are respectively locked on two opposite sides of the rail through fasteners, so that the locking of the connecting rod can be realized. The simple guardrail locking device of the invention can be used on rails of different widths, which has high activity, strong practicability and greatly saves the use of materials. In addition, because the track is located 30 on-orbit pillow, 30 tracks and there is a big gap between the ground, and 30 tracks and ground clearance does not affect the operation of railway, the present invention makes full use of the tracks at the bottom of the gap with simple installation guardrail locking device, on the premise of not affect the normal use of the tracks, the locking device installation is more simple and stable.

[0030] The foregoing are only a few better embodiments of the invention and are not intended to limit the invention, and any modification, equivalent substitution, or improvement made within the spirit and principles of the invention shall be included in the protection of the invention.

Claims

1. A simple guardrail locking device, which is used to install the safety guardrail on the railway track; The characteristics are as follows: the simple guardrail locking device comprises a clamping plate, a press plate, a bottom plate, a connecting rod and a number of fasteners. The bottom plate is arranged horizontally, and an adjusting part is arranged on the bottom plate; The card plate and press plate spacing are arranged on the bottom plate, and are locked on two opposite sides of the rail respectively through fasteners. At least one of the card plate and press plate is detachable and mounted on the adjusting part of the bottom plate. The adjusting part adjusts the distance between the clamping plate and the clamping plate, and the clamping plate and the clamping plate are arranged in a vertical parallel arrangement or a tilted extension arrangement.
2. As for the simple guardrail locking device mentioned in claim 1, its characteristics are as follows: the card plate is connected to the bottom plate in one piece and the press plate is disassembled and mounted on the bottom plate.
3. As for the simple guardrail locking device mentioned in claim 2, its features are as follows: the top surface of the bottom plate is provided with a plurality of mounting holes arranged side by side, and the bottom surface of the press plate is extended downward with a guide column, which is arranged in the corresponding mounting hole on the bottom plate according to the demand card.
4. As for the simple guardrail locking device mentioned in claim 2, its characteristics are as follows: the press plate is provided with an installation part, and the installation part is provided with a limit hole running through the installation part along the extension direction of the press plate, and the bottom plate card is arranged in the limit hole.
5. As for the simple guardrail locking device mentioned in claim 2, its features are as follows: the bottom of the bottom plate is provided with a card slot, and the bottom end of the card slot on one side of the self-pressing plate is extended in the direction of the card plate; The middle part of the groove bottom of the card groove is provided with a bayonet, and the bayonet runs vertically through the bottom plate.
6. As for the simple guardrail locking device mentioned in claim 5, its characteristics are as follows: the bottom surface of the press plate is provided with a buckle part, and the buckle part is an inverted t-shape setting, which includes a connecting column and a limit table at the bottom end of the connecting column, the connecting column is arranged in the bayonet of the bottom plate, and the limit table card is arranged on the bottom surface of the groove.
7. The simple guardrail locking device mentioned in claim 1 is **characterized in that** the bottom plate and connecting rod are connected to both ends of the pressing plate, and the card plate is an independent part.
8. As for the simple guardrail locking device mentioned in claim 7, its features are as follows: the top surface of the bottom plate is provided with a plurality of mounting holes side by side, and the bottom surface of the card plate is provided with a guide column extending downward, which is arranged in the corresponding mounting hole according to the demand card.
9. As for the simple guardrail locking device mentioned in claim 7, its characteristics are as follows: the buckle part is provided with an installation part, and the installation part is provided with a limit hole running through the installation part along the direction of the bottom plate extension, and the bottom plate card is arranged in the limit hole.
10. As for the simple guardrail locking device mentioned in claim 7, its features are as follows: the bottom of the bottom plate is provided with a card slot, and the middle of the slot bottom is provided with a bayonet, and the bottom of the press plate is provided with a buckle. The buckle is arranged through the bayonet and on the bottom of the card slot.

Text in the drawings:

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/085075

A. CLASSIFICATION OF SUBJECT MATTER

E04H 17/14 (2006.01) i; E04H 17/22 (2006.01) i; E01B 26/00 (2006.01) i
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)

E04H 17, E01B 26/00, E01F 13, E01F 15, E04G 21/32

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)

CNABS, CPRSABS, CNTXT, EPODOC, WPI, CNKI: 护栏, 围栏, 栏杆, 锁, 固定, 铁轨, 铁道, 调位, 调节, 位置, 分体, 可拆卸, 卡, 压, 槽; guard, rail, fence, enclosure, lock, fix, track, railway, adjust, position, separate, detachable, clamping, clip, press, groove, slot

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 207538574 U (YU, Guangming) 26 June 2018 (26.06.2018), description, paragraphs [0006]-[0040], and figures 1-10	1-10
X	DE 19503638 C1 (LADEMANN BEWACHUNGSSCHUTZ) 25 April 1996 (25.04.1996), description, column 2, line 36 to column 3, line 64, and figures 1-3	1-10
X	EP 0708204 A1 (LEONHARD WEISS GMBH & CO.) 24 April 1996 (24.04.1996), description, column 6, line 15 to column 7, line 52, and figures 1 and 6-9	1-10
A	FR 2904836 A1 (EUROP DE TRAVAUX FERROVIAIRES) 15 February 2008 (15.02.2008), entire document	1-10
A	EP 0882840 A1 (URLINGS JOSEPH HUBERTUS MARIE) 09 December 1998 (09.12.1998), entire document	1-10

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 06 July 2018	Date of mailing of the international search report 17 July 2018
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer WANG, Tao Telephone No. (86-10) 62085052

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/085075

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 103422714 A (CONSTRUCTION INSTALLATION ENGINEERING CO., LTD. OF CHINA RAILWAY 25TH BUREAU GROUP et al.) 04 December 2013 (04.12.2013), entire document	1-10
A	CN 206467598 U (TIANTAI HENGYUAN CONSTRUCTION CO., LTD.) 05 September 2017 (05.09.2017), entire document	1-10

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International application No.
 PCT/CN2018/085075

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