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F16D 65/08

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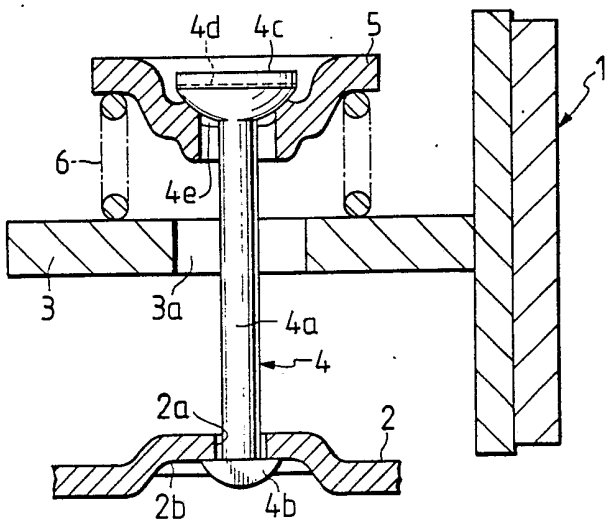
GB 1553053 GB 1551909
Laid-open Japanese utility model application No 53930/83

(58) Field of search
E2A
F2E
Selected US specifications from IPC sub-class F16D

(54) Drum brake with brake shoe hold-down device

(57) A drum brake comprises a backing plate (2) having a rectangular hole (2a), and a brake shoe (1) disposed in front of the backing plate and provided with a web (3) having an opening (3a). A hold-down pin (4) is inserted into the opening of the web, the pin being provided at an end thereof with an engagement portion (4b) of rectangular shape. The engagement portion passes through the rectangular hole and is rotated by a predetermined angle, such as 90°, for example, so that it is engaged with edge portions of the rectangular hole from the rear side of the backing plate. A hold-down cup (5) is engaged with, or integral with, a head portion (4c) of the hold-down pin, and a compression spring (6) is disposed between the hold-down cup and the web of the brake shoe. The head portion of the hold-down pin is provided with a groove (4d) having a predetermined positional relationship with respect to the longitudinal extent of the engagement portion.

FIG. 1



The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

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FIG. 1

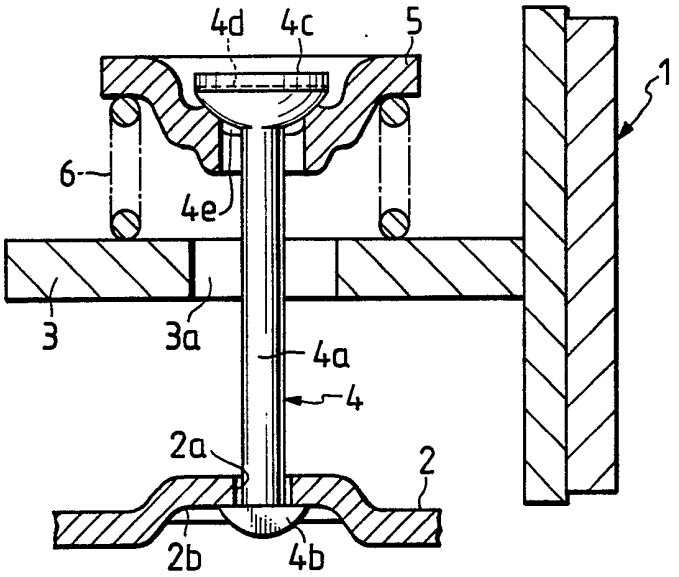


FIG. 2

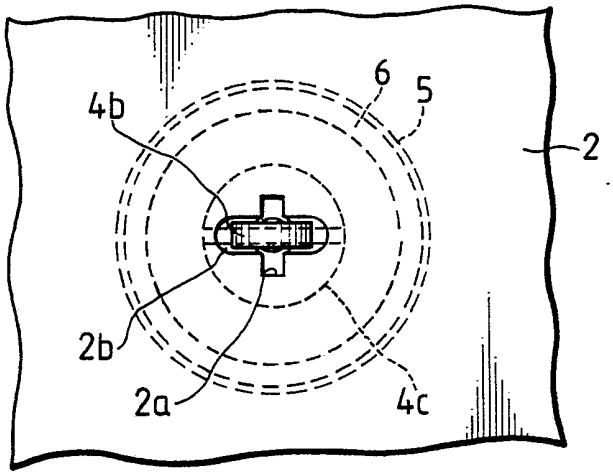


FIG. 3

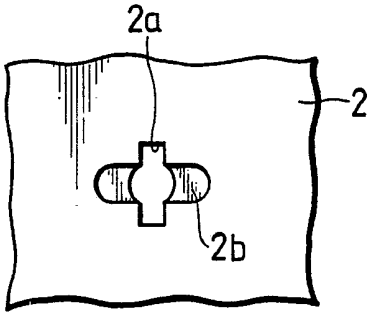


FIG. 4

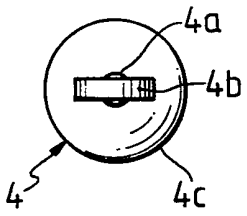


FIG. 5

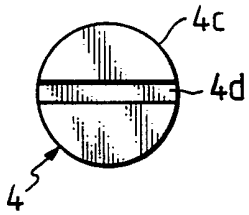


FIG. 6

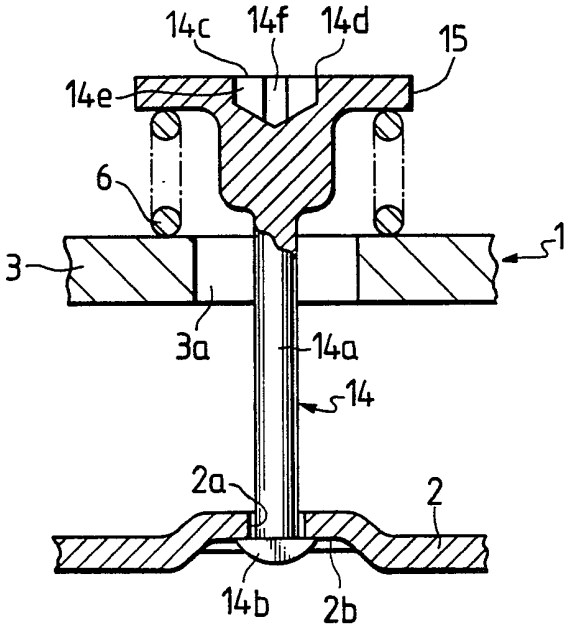
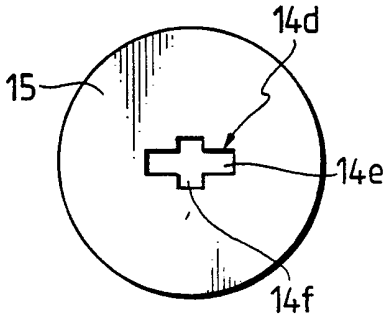


FIG. 7



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SHOE HOLD-DOWN APPARATUS FOR DRUM BRAKE

The present invention relates to a shoe hold-down apparatus for a drum brake.

The conventional shoe hold-down apparatus for a drum brake is well known as disclosed in unexamined Laid-Open Japanese Utility Model Application No. 53930/83, in which a hold-down pin can be removed from the front side (at which the brake shoe is arranged) of a backing plate.

According to the conventional shoe hold-down apparatus above, a hold-down cup is secured to a base end of the hold-down pin, the pin is pushed into the hold-down cup by using a special tool, a rectangular engagement portion formed at an end of the pin is inserted through a rectangular hole of the backing plate, then the hold-down cup is rotated by about 90°, thereby the engagement portion of the pin is so installed as to engage elastically with the peripheral edge of the rectangular hole of the backing plate. However, since it is difficult to determine the positional relationship between the annular hold-down cup and the longitudinal direction of the engagement portion of the hold-down pin, requiring a skill of an operator to determine the relationship, it is

inefficient. Further, an accurate installation of the pin must be confirmed from a rear side of the backing plate, which would be intricate.

It is, therefore, an object of the present invention to provide a shoe hold-down apparatus for a drum brake which can be easily installed and removed. Further, another object of the invention is to provide a shoe hold-down apparatus for a drum brake which enables easy confirmation of the installed condition of the apparatus.

The apparatus of the invention comprises a backing plate having a rectangular hole, a pair of brake shoe disposed at a front side of the backing plate, each brake shoe provided with a web having an opening, a hold-down pin which inserts into the opening of the web, the pin is provided at an end thereof with an engagement portion of a rectangular shape. The engagement portion passes through the rectangular hole and the pin is rotated by a predetermined angle, such as 90°, for example, so that it is engaged with an edge portion of the rectangular hole from the rear side of the backing plate. The apparatus further comprises a hold-down cup which is engaged with a head portion of the hold-down pin, and a compression spring disposed between the hold-down cup and the web of

the brake shoe. The head portion of the hold-down pin is provided with a groove having a predetermined positional relationship with respect to a longitudinal direction of the engagement portion of the hold-down pin.

In the drawings:-

Fig. 1 is a sectional front view of a first embodiment of the present invention.

Fig. 2 is a sectional bottom view of the first embodiment.

Fig. 3 is a bottom view showing an essential part of the backing plate.

Fig. 4 is a bottom view showing the hold-down pin.

Fig. 5 is a plan view of the hold-down pin.

Fig. 6 is a sectional front view showing a second embodiment of the present invention.

Fig. 7 is a plan view depicting the hold-down pin shown in Fig. 6.

Preferred embodiments of the present invention will be described with reference to the accompanying drawings.

Figs. 1 to 5 show a first embodiment of the present invention. A pair of brake shoes 1 are disposed,

opposite to each other, on a backing plate 2 fixed to the non-rotatable portion of the vehicle. A web 3 of the shoe 1 is provided with an opening 3a. As shown in Fig. 3, a rectangular hole 2a is formed on the backing plate 2 so as to be opposite to the opening 3a, and a rectangular dent 2b is provided at the rear side of the plate 2 so that a longitudinal axis of the rectangular dent 2b crosses that of the rectangular hole 2a.

A hold-down pin 4 is formed of a shaft portion 4a, an engagement portion 4b, and a head 4c. The shaft portion 4a is provided at an end thereof with the engagement portion of rectangular shape as shown in Fig. 4. The hemispherical head 4c is formed at a base end of the shaft portion 4a. A tool engagement groove 4d is disposed on a surface of the head 4c in the radial direction thereof.

The hold-down pin 4 thus structured is preliminarily fixed by inserting the shaft portion of the pin 4a through the opening 3a and engaging the annular hold-down cup 5 at the rear surface of the head 4c and installing a spring 6 between the cup 5 and the web 3 of the brake shoe 1. Then, a conventional screw driver is applied to the tool engagement groove 4d to compress the spring 6 and to push down the hold-down pin 4, in order to pass the engagement portion 4b through the rectangular

hole 2a of the backing plate 2. Then, the screw driver rotates the hold-down pin 4 through the predetermined angle (about 90°) and the driver is disengaged from the pin so that the engagement portion 4b fits unrotatably in the dent 2b. Thus, the engagement portion 4b is engaged elastically with the rear side of the peripheral edge of the rectangular hole 2a.

As described above, the provision of the predetermined positional relationship (in the embodiment, it is a parallel relation) between the longitudinal direction of the tool engagement groove 4d and the longitudinal direction of the engagement portion 4b enables to make the tool engagement groove 4d an index. After the engagement portion 4b passes through the rectangular hole 2a, it can be confirmed visually that the tool engagement groove 4d rotates through the predetermined angle relative to the rectangular hole 2a (in this case, it is rotated to be the crossing at a right angle). Further, an operator can confirm that the engagement portion 4b is suitably and firmly engaged with the backing plate 2 so as not to become disengaged from the plate 2. As a result, it would be unnecessary to visually confirm an accurate engagement condition of the engagement portion 4b with the backing plate 2 from the rear side of the plate 2.

The hold-down pin 4 is easily removed by pushing-down the pin with a screw driver applied to the tool engagement groove 4d and rotating the pin 4 by a predetermined angle (90°), thereby disengaging the pin from the dent 2b of the backing plate 2. In this operation, it is possible to give a predetermined positional relationship between the tool engagement groove 4d and the rectangular hole 2a, in order to easily remove the hold-down pin 4 from the rectangular hole 2a.

The shoe hold-down apparatus for a drum brake thus constituted prevents resiliently a moving up of the brake shoe 1 by means of a spring 6. When the hold-down pin 4 and the hold-down cup 5 are made individually as in the embodiment, even if the hold-down pin 4 slants during braking, any slanting of the cup 5 is prevented and an eccentric load application to the web 3 due to the spring 6 would decrease. The reason of contacting of the rear surface of the head 4c with the hold-down cup 5 through a round face 4e is to effectively control the slanting of the cup 5.

If a crossing relationship is applied to the longitudinal directions of the tool engagement groove 4d and the engagement portion 4b, the similar effect as mentioned above can be apparently obtained.

Figs. 6 and 7 show a second embodiment of the present invention and the same reference numerals are applied to the same parts and members as that of the first embodiment. In the second embodiment, the hold-down cup 15 is integrally formed on the head 14c of the hold-down pin 14 and a tool engagement groove 14d of a cross shape is formed on the surface of the head 14c. The apparatus is provided with a shaft portion 14a and an engagement portion 14b.

One groove 14e of the tool engagement groove 14d is longer than another groove 14f as shown in Fig. 7, descriminating the linear groove 14e from the other one 14f in order to make the former an indicator or index. The predetermined positional relationship similar to that of the first embodiment is given to these longitudinal directions of the linear groove 14e and the engagement portion 14b. According to the second embodiment, it is possible to use a cross-shaped screw driver when the hold-down pin 14 is installed and removed, and the same effect as that of the first embodiment can be obtained.

As described above in detail, according to the present invention, it is possible to remove the hold-down pin from the front surface of the backing plate by means of a screw driver without any problem. As a result, it is

also possible to easily and securely confirm the accurate installation condition of the hold-down pin without any necessity of preparation of a special tool, which is a practical effect.

CLAIMS

1. A shoe hold-down apparatus for a drum brake, comprising:

a backing plate having a rectangular hole;

a brake shoe disposed in front of the backing plate, the brake shoe being provided with a web having an opening;

a pin member insertable in the opening of the web, the pin member being provided at an end thereof with an engagement portion passable through the rectangular hole, and being rotatable by a predetermined angle for engagement with an edge portion of the rectangular hole on the rear side of the backing plate;

a hold-down cup engagable with a head of the pin member; and

a spring member disposed between the hold-down cup and the web of the brake shoe, the spring member being compressed when the shoe is in its normal condition,

the head of the pin member having a groove with a predetermined positional relationship with respect to the longitudinal dimension of the engagement portion.

2. Apparatus according to claim 1, wherein the groove is linear.

3. Apparatus according to claim 1, wherein the groove is cross-shaped.

4. Apparatus according to claim 1, wherein the head and the hold-down cup are separately formed.

5. Apparatus according to claim 1, wherein the head and the hold-down cup are integrally formed.

6. Apparatus according to claim 2, wherein the groove and the longitudinal direction of the engagement portion are parallel.

7. Apparatus according to claim 1, substantially as described with reference to the accompanying drawings.

8. A drum brake having shoe hold-down apparatus according to any one of claims 1 to 7.

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